Public Safety & Sour Gas

Provincial Advisory Committee on Public Safety and Sour Gas

DECEMBER 2000

FINDINGS AND RECOMMENDATIONS
FINAL REPORT

ACKNOWLEDGEMENTS

The Advisory Committee on Public Safety and Sour Gas acknowledges and thanks all those who have provided input and assistance to the Advisory Committee. Their involvement has contributed significantly to the work of the Advisory Committee in the preparation of this final recommendations report. The Advisory Committee thanks all those who contributed in one or more of the following ways:

- **Participating in the public outreach processes by attending a session in your community**
- **Completing Response Forms**
- **Providing written submissions or comments by telephone**
- **Responding to the Random Sample Telephone Survey**
- **Providing expert opinion on a variety of issues, including toxicology, dispersion modelling, public consultation, risk communication, emergency response, resource development, and jurisdiction; this includes experts both within and outside of the Alberta Energy and Utilities Board**
- **Serving as an alternate to an Advisory Committee member or on a working group when not a member of the Advisory Committee**
- **Providing support to the overall process**

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The final report and appendices are available on the Advisory Committee's Web site at www.publicsafetyandsourgas.org.

EXECUTIVE SUMMARY

The Alberta Energy and Utilities Board (EUB) formed an Advisory Committee (Committee) on Public Safety and Sour Gas in January 2000 to review the regulatory system for sour gas as it relates to public health and safety. The Advisory Committee includes representation from all major stakeholders. It conducted an extensive outreach program and received considerable input from persons living in sour gas areas or involved with sour gas in some other manner.

On the basis of the input received, the Committee reviewed the sour gas regulatory system. In October 2000, it issued an interim *Directions* document that identified those issues related to the sour gas regulatory system that it believed to be of greatest importance. It also identified the direction it was moving in with respect to recommendations to address each of the issues.

The Committee conducted a second outreach program and received considerable input by way of reaction to its *Directions* report. It used that input to finalize its findings and recommendations.

Alberta currently has an extensive and comprehensive oil and gas regulatory and enforcement system. The Committee is of the view that the EUB and the industry are overall endeavoring to ensure that sour gas operations have minimal negative impacts on the public. While the Committee is aware that progress has been made, most notably in initiatives like the Appropriate Dispute Resolution process and increased public consultation requirements, the Committee believes that further improvements must be made. On the basis of all the information received throughout the process, it has developed 87 detailed recommendations directed towards

- a better understanding of sour gas,
- improving the sour gas regulatory system,
- reducing the impacts of sour gas on public health and safety, and, most importantly,
- improving the consultation that takes place with the public on all sour gas matters.

A major area where further effort is needed, on a priority basis, is in the understanding of the effects of sour gas on human health. Effort is also needed to standardize the technical procedures related to dispersion modelling and probabilistic risk assessment. These should then be used with the improved knowledge of health effects, to review current policy and requirements to protect public health and safety.

To accomplish this, the Committee is recommending that the EUB work with appropriate stakeholders to

- Develop comprehensive health effects information for sour gas mixtures and the combustion products of sour gas;
- Identify and support required research respecting the health effects of sour gas;
- Develop a framework and methodology for standardizing dispersion modelling and probabilistic risk assessment, and update them regularly;
- Upgrade EUB sour gas databases; and
- Review the current criteria and approach for establishing sour gas setbacks and for emergency planning zones (EPZ's) on the basis of the health effects information and standardized dispersion modelling and risk assessment methodology.

Another area of major concern relates to the effectiveness of consultation amongst all parties involved with sour gas. In this respect, the Committee is recommending

- A more consistent approach to public consultation;
- More stringent action by the EUB to ensure public consultation programs are effective;
- Development of effective public consultation and communications training programs;
- Formation of an EUB information office and a staff resource team that focuses on public consultation;
- Improved written material on technical issues related to sour gas and the role of the EUB and its regulatory and enforcement actions;
- Greater emphasis by the EUB in developing relationships with all stakeholders;
- More information sessions and workshops respecting sour gas; and
- Actions that would make it easier for the public to contact appropriate industry and EUB officials.

The Committee believes special attention is required to improve the relationship between the EUB and Aboriginal people. Towards this objective, it is recommending that the EUB

- Engage appropriate staff, including First Nations persons, and consider forming an Aboriginal advisory committee, to ensure more interaction among the EUB, industry and Aboriginal people;
- Strictly apply its public consultation requirements in and around First Nations and Metis communities;
- Ensure that a good complaint, monitoring and incident response program exists in First Nations and Metis communities; and
- Work with federal and other levels of government to ensure effective relationships among all parties, to eliminate gaps in regulation, to ensure overlap in regulation is handled efficiently, and to provide adequate infrastructure and resources to Aboriginal people for planning and development of disaster services capability.

The Committee heard many concerns about all aspects of emergency response planning (ERP), including the decision-making processes used to approve reduced emergency planning zones. It is making many recommendations to address these matters. They include

- At the time of application, assessment by the EUB of the capability of an operator to effectively implement an ERP;
- Improved early coordination with other responders and other plans in the area;
- More frequent audits by the EUB and development of requirements for mandatory testing of ERPs;
- Development of requirements and clear evacuation criteria for sulphur dioxide(SO_2) when a well is ignited;
- Development of clear criteria for introducing a reduced EPZ;
- Clarification of additional required protective measures for public health and safety when an EPZ is reduced, including improved definition of immediate ignition and roles and responsibilities; and

- More complete and concise guidelines and requirements for the development and implementation of ERPs.

The Committee directs numerous recommendations towards improving the EUB sour gas regulatory system as it relates to public health and safety. These include

- Consolidation, where possible, of sour gas requirements, and preparation of a summary document of requirements;
- Consideration of some additional or revised regulations;
- Increased inspections and audits, particularly for operators without a good performance record in sour gas operations;
- Improved response to sour gas complaints and more involvement of EUB staff in solving operational issues;
- Alterations to the enforcement ladder for sour gas operations to involve fewer, faster steps and more severe sanctions where there is a threat to public health and safety;
- Greater attention to the content and review of sour gas applications;
- Greater reliance on mediation and less formal hearings when they do occur;
- Recognition by the EUB of the performance of applicants in sour gas operations when making decisions;
- Greater recognition of public input and more descriptive material respecting public interest criteria in decision reports;
- The availability of appropriate expertise to the EUB; and
- Greater emphasis by the EUB on its role as a neutral regulator and on the profile of matters related to public health and safety.

The Committee recommends that, as the principal regulator of sour gas matters, the EUB take the lead role in clarifying and coordinating the responsibilities and roles of all parties that have some jurisdiction respecting sour gas. The Committee believes there are benefits to be gained by the parties working together in this regard. In terms of planning, the Committee recommends the immediate formation of a task force to investigate the possibility of improving coordination between subsurface and surface planning and development. It also recommends more stringent enforcement of the EUB's sour plant proliferation policy, and increased efforts to minimize proliferation of other sour gas facilities.

A number of recommendations are directed towards improved follow up of major sour gas releases, and efforts towards a more consistent medical response and improved records for those who have experienced substantial exposures to sour gas. Additionally, the Committee recommends that the EUB review current monitoring capability and ensure that it is adequate, not only for significant sour gas releases, but for other required monitoring such as complaint response and compliance programs.

A number of recommendations deal with the need to review, and, as appropriate, improve training for both industry and EUB personnel, in all relevant areas, including knowledge of sour gas, communication of risk and other technical information, and consultation with the public.

The Commitee is asking the EUB to develop a plan to implement all of its recommendations, to make the plan public, and to publicly report progress towards implementation, each calendar year quarter, until all of the recommendations have been addressed.

IMPLEMENTATION

The Advisory Committee presents many recommendations in this report on public safety and sour gas. It makes the following requests of the EUB regarding the implementation of those recommendations:

- The EUB serve as the reporting agency for all recommendations in the report, including those that, in whole or part, require actions by others.

- The EUB issue public quarterly status reports respecting the planned actions and current progress on each recommendation. This reporting should be continued until implementation or action has been taken on all the recommendations. The first such report should include an overall implementation plan, including time-lines.

- The EUB establish a method of measurement for actions taken to implement each recommendation to assess if the actions are accomplishing the expectations of each recommendation. This assessment should be included in the quarterly status reports.

The Advisory Committee intends to meet annually until all the recommendations are implemented or acted on. At these meetings, the Committee will evaluate the actions taken by the EUB towards implementation and then provide an evaluation report to the EUB and all stakeholders. Additionally, members of the Committee will be available to assist the EUB in implementing the recommendations.

The Committee recognizes that there will be costs associated with the implementation of its many recommendations. It has attempted to address this, in part, by ensuring that its recommendations are practical and implementable. Additionally, the Committee believes there is a possibility that some of the costs of implementation might be covered by refocusing effort and resources away from issues of lesser importance towards paramount issues, such as sour gas and public health and safety. The Committee also believes that over time a higher level of public confidence respecting matters like sour gas and public health and safety will make the regulatory system more efficient, while remaining fully effective.

To the extent that implementation of its recommendations requires additional funding, such as for increased monitoring or increased involvement of municipalities or regional health authorities, the Advisory Committee believes that these funds should be provided by the Provincial Government. This is consistent with the position put forward by several public participants in the outreach process who expressed concern that those in sour gas areas are forced to directly carry the costs associated with the negative impacts of sour gas on health and life style, including the risks, by their proximity to sour gas developments. They take the position that they should not have to also carry the costs in dollars and in time to study applications, review them for weaknesses, learn about sour gas, and help prepare and test emergency response plans. They contend that these are regulatory matters that should be normally handled by the regulator, other government departments, or municipalities in a responsible manner on behalf of the public. The funding for this, in their view, should come from the province as a whole.

ADVISORY COMMITTEE ON PUBLIC SAFETY AND SOUR GAS

FINDINGS AND RECOMMENDATIONS REPORT

1 INTRODUCTION

The Alberta Energy and Utilities Board (EUB) formed the Advisory Committee on Public Safety and Sour Gas (the Advisory Committee or Committee) in January 2000 to review and make recommendations respecting the sour gas regulatory system as it relates to public health and safety. The Advisory Committee included representation from a broad spectrum of stakeholder groups. The EUB has expressed to the Advisory Committee its commitment to serious consideration of the Advisory Committees recommendations with implementation to follow. A similar process took place in 1993, resulting in a *Report and Recommendations to the ERCB on Public Safety and Sour Gas* dated February 1994. Copies of the 1994 report are available from the EUB's Information Services.

Before the Advisory Committee completed this Findings and Recommendation Report it issued a *Directions* document *(Directions: A Work in Progress, October 2000)* outlining the key issues identified by the Advisory Committee from an extensive public outreach and stakeholder consultation program. The *Directions* document set out the directions the Advisory Committee was moving towards in terms of recommendations, and reaction was sought from stakeholders including the general public.

This Findings and Recommendations Report provides background to the formation of the Advisory Committee, describes the Advisory Committee and its mandate, briefly outlines the process the Advisory Committee used to conduct its work, and provides a set of final recommendations to the EUB.

1.1 Background

The sour gas industry has been well established in Alberta for more than 40 years. More than one-third of Alberta's natural gas is 'sour gas', which is gas containing hydrogen sulphide (H_2S). Sour gas is very toxic to humans and animals at relatively low concentrations. Therefore, the exploration for and production of sour gas must be undertaken with special equipment and safety procedures to assure both worker and public safety.

The EUB is responsible for the regulation of sour gas development in Alberta. It must ensure that development of the sour gas resource takes place in a responsible manner that balances the risks to health and safety and the benefits to all Albertans and assures public safety and protection of health. The EUB has established many regulatory requirements that industry must follow in exploring for and developing sour gas resources. These regulations are continuously reviewed to ensure that they remain appropriate and consider changes in technology and address public concerns.

As a result of increasing public health and safety issues and concerns regarding growth and operation of sour gas wells and facilities near both rural and urban development, a review of the adequacy of current regulatory requirements was deemed desirable by the EUB. The EUB wanted this review to include the widest spectrum of input from those stakeholders ultimately

affected by sour gas development. In particular, the EUB wanted the review to explore the expectations of the general public living in sour gas areas.

1.2 The Advisory Committee

The Advisory Committee has 22 members who reflect a broad cross-section of stakeholders affected by sour gas development. It includes experts from disciplines such as risk management and health. Funding, secretariat services, and support was provided by the EUB.
The following lists the members of the Advisory Committee and their alternates. A short biosketch of each member is provided in Appendix A.[1]

Members	Constituency Represented
Gerry DeSorcy	Chairman
Marilyn Craig	Secretariat
Paul Jackson	Public-at-large
Brian Winter	Public-at-large
Judith Bugg	Public-at-large
Doreen Healy	Aboriginal Relations
Brent Friesen	Regional Health Authorities
Alternate: Tim Lambert	
Bart Guyon	Alberta Association of Municipal Districts and Counties
Barry Virtue	Alberta Urban Municipalities Association
Marjorie Young	City of Calgary Administration
Alternate: Harvey Rindfliesch	
Randy Gossen	Oil and Gas Industry
Alternate: John Kerkhoven	
Frank George	Oil and Gas Industry
John Squarek	Oil and Gas Industry
Bob Clark	Land Development Industry
Robert Ollerenshaw	Land Development Industry
Kevin McLeod	Alberta Health and Wellness
Alternate: Alex MacKenzie	
David Spink	Alberta Environment
Maureen Bolen	Alberta Agriculture, Food and Rural Development
Cindy Miller Reade	Alberta Municipal Affairs, Local Government Services
Alternate: Bill Symonds	
Ron Wolsey	Alberta Municipal Affairs, Disaster Services
Alternate: Ralph Holmes	
Dan Clarke	Alberta Human Resources and Employment
Steve Hrudey	University Risk Research
David Wilson	University Risk Research

[1] The Appendices, which are substantial in length, are contained in a separate volume. Given the size of the Appendices, and since many readers will be primarily interested in the final recommendations of the Advisory Committee, the Appendices are not being distributed with this report. The Appendices are available on the Committee's Web site at www.publicsafetyandsourgas.org. You may also pick up or order copies at no charge from the EUB's Information Services (403) 297-8190 (this number may be reached toll-free in Alberta by dialing 310-000) or from any of the EUB's Field Centres throughout the province.

1.3 Mandate

The scope of the Advisory Committee's work was centred on a review and assessment of public health and safety-related requirements currently being applied to the approval, development, and operation of facilities respecting Alberta's sour natural gas resources.

The Advisory Committee's Terms of Reference are included as Appendix B. "Public Health and Safety" as used in the Terms of Reference includes immediate or long-term effects of short-term exposure to sour gas on human health. It does not include possible long-term or chronic effects of very low concentrations of sour gas on human health, as this issue is being dealt with through other initiatives.

Similarly, the mandate of the Advisory Committee did not include chronic animal health, sulphur recovery guidelines, flaring requirements, or compensation matters related to a sour gas release, as these issues are being dealt with through other initiatives.

Since these types of issues could not be isolated from the work of the Advisory Committee, nor from the community, they were discussed and considered when directly relevant to the Advisory Committee's mandate. Observations and comments regarding these matters have been included in the Advisory Committee's final report.

2 PROCESS

The Advisory Committee used a variety of methods to enhance its understanding of the current regulatory system and to receive input respecting its effectiveness.

2.1 Advisory Committee Meetings

The diverse backgrounds, experience, and professional responsibilities of the Advisory Committee members resulted in a Committee, which as a whole, has a broad view of the issues associated with public health and safety and sour gas. In order to obtain a clear, common understanding of the current system, EUB and other experts provided the Advisory Committee with detailed information regarding current requirements and practices on many topics within the mandate of the Advisory Committee. (Written reports received from experts are identified in Appendix G.) These presentations and related discussions took place at meetings of the full Advisory Committee or at meetings of three focussed working groups formed by the Advisory Committee. These three working groups — Prevention, Policy and Jurisdiction; Event Consequence Management; and Communication and Compensation — were established to facilitate the work of the Advisory Committee. During the group meetings, Advisory Committee members brought forward views of their own constituents to be considered along with the input from others. Advisory Committee members visited a sour gas plant, well site, and drilling rig.

2.2 Public Outreach and Consultation Program

2.2.1 Public Outreach

To identify the public's concerns and issues and possible solutions related to public health and safety and sour gas, the Advisory Committee undertook a public outreach and consultation

program. Although the mandate of the Advisory Committee was to look at the immediate and long-term effects of short-term exposure to sour gas on human health, it agreed that all other sour gas issues would be noted, and therefore discussion of other matters was not restricted during any of the sessions.

The consultation process included regional discussion sessions held in June 2000 in 12 provincial locations directly affected by sour gas development. A total of 231 individuals attended the sessions. Through these sessions, Advisory Committee members gained an understanding of the public's issues, concerns and suggestions related to public health and safety and sour gas. Appendix C includes a summary of the input received at the regional discussion sessions. It is organized into three topic categories: Prevention, Policy and Jurisdiction; Event Consequence Management; and Communication and Compensation. Those comments not related to the mandate of the Advisory Committee are also summarized in the appendix under different headings.

2.2.2 Aboriginal (First Nations and Metis) Consultation

To provide Aboriginal people the opportunity to present their issues, concerns, and solutions related to sour gas and public health and safety to the Advisory Committee, a series of ten discussion sessions were conducted from May to August. These small group meetings involved representatives from each of the participating First Nation or Metis organizations or communities, members of the Advisory Committee, and senior representatives from the EUB. Each of the discussion sessions was conducted within the local communities or organization offices. Written submissions were also received from a few Aboriginal organizations.

The sessions and written input generated a series of common key issues related to sour gas. A summary of the material is provided in Appendix C.

2.2.3 Random Sample Telephone Survey

A random sample telephone survey was conducted to gather information from a broad representative group of Albertans living in areas of sour gas development about their awareness, perceptions, and concerns regarding sour gas activities in the province. A summary of the results of the survey is included in Appendix D. A more detailed report on the survey is on the Advisory Committee's Web site, www.publicsafetyandsourgas.org.

2.2.4 Input Received by Other Means

The Advisory Committee provided the opportunity for the public to submit input by completing a response form either on the Advisory Committee's Web site or by mail. Forms were available at the discussion sessions or by requesting one directly by calling the Advisory Committee.

Members of the public were also invited to make written submissions stating their views to the Advisory Committee throughout the whole process. Some of the written submissions were submitted electronically. Numerous submissions were received and a summary of the input received is also reflected in Appendix C.

2.2.5 *Directions* Document and Reaction Process

After the first outreach program the Advisory Committee prepared a *Directions* document entitled; "*Directions*: A Work in Progress". The Directions section of that report is included as Appendix E. This *Directions* document was mailed to all those who participated in the regional discussion sessions. It was also mailed to numerous government agencies, industry associations, and other public interest groups, and made available on the Committee's Web site. Through this process the Advisory Committee requested feedback and reactions to its summarization of issues, identification of key issues, and the directions of possible solutions.

The Advisory Committee then held further outreach sessions in October 2000 in nine of the twelve locations it visited during the regional discussion sessions. A total of 130 individuals attended this second outreach program and provided the Advisory Committee with valuable feedback on its *Directions* document. The Advisory Committee also held a second series of discussion sessions with the Aboriginal organizations and communities to get their feedback and input. In addition, the Committee received a number of written submissions in response to the *Directions* document. A response form was also utilized by the Advisory Committee to obtain feedback from the public on the *Directions* document. Appendix F is a summary of the entire written and public meeting reactions received from all participants in the outreach program regarding the *Directions* document. It has been organized in the sequence of the major issues identified by the Committee in its *Directions* document.

Appendices C and F are summaries of all the stakeholder input received by the Advisory Committee. That input is reflected in the findings and recommendations of the Committee as presented in section 4 of this report. The Committee is of the view that, in addition to reviewing and implementing the Committee's recommendations, the EUB, industry and involved government departments, should carefully review the two appendices as they provide valuable insights into the views of the public respecting sour gas and health and safety.

3 IDENTIFICATION AND GROUPING OF ISSUES

Those who participated in the Advisory Committee's outreach process raised many concerns and issues through public outreach sessions held in communities, completed response forms, written submissions, or replies to questions asked during the telephone survey. Also, members of the Advisory Committee, on their own behalf or on behalf of constituent groups, put forward concerns.

In total, these issues numbered in the hundreds and related to almost all aspects of oil and gas operations. Many of the concerns, although expressed in different words, were similar to concerns raised by others. Some related to fundamental policy matters, such as whether or not sour gas resources should be developed and who should have jurisdiction if they are developed. Many related to the role of the EUB in regulating sour gas development and to industry procedures and practices. Some dealt with detailed technical matters, while others were more general in nature. Many expressed the importance of communication among all parties involved with sour gas.

In order to determine its directions and ultimately its recommendations, the Advisory Committee grouped the many different issues into common subject areas. In the work leading up to the *Directions* document, the Advisory Committee categorized the issues into three groups. They were (1) Prevention, Policy and Jurisdiction (2) Event Consequence Management, and (3) Communications and Compensation. Within these groupings, it identified the key priority issues that were outlined in the *Directions* document. For each priority issue the Advisory Committee identified the direction it was moving in with respect to its recommendations. When input was received and reviewed from the reaction process on the *Directions* document, the priority issues and directions proposed by the Advisory Committee were generally confirmed.

The Advisory Committee in its deliberations respecting the findings and recommendations decided that it could further combine some of the priority issues into common areas. The re-structuring of common areas does not reduce the importance or content for each issue, but in the view of the Committee better illustrates the relationship between the different issues. The re-structured priority issues are, in no particular order of priority, shown below:

1 Jurisdiction and Development Planning

- Jurisdiction of Government Departments and Agencies
- Coordination of Surface and Subsurface Planning
- Subsurface Resource Development Planning

2 Health Effects

3 Technical Information

4 EUB Role

- Regulations
- Enforcement
- Applications and Decisions
- Industry Procedures and Personnel
- Setbacks
- Emergency Response

5 Monitoring

6 Communications

- Public Consultation
- Public Awareness and Understanding
- Interaction of the EUB with Stakeholders

7 Aboriginal (First Nations and Metis) Issues

8 Non-mandate but Important Issues

The above represent the highest priority areas of concern as identified throughout the process. **The issues are not listed in order of priority or importance.** The Advisory Committee discussed the need to prioritize the issues and its recommendations and concluded it should not do so. The reason for this is that it believes all the recommendations are important. The Committee further believes that some of the recommendations may be easier or quicker to implement than others and does not wish to see those delayed because implementation of another recommendation of higher priority is delayed. The Advisory Committee does identify those recommendations it sees of greatest importance when it presents the findings and recommendations in the next section of the report.

4 FINDINGS AND RECOMMENDATIONS OF THE ADVISORY COMMITTEE

4.1 INTRODUCTION

The Advisory Committee was mandated to review the regulatory system for sour gas as it relates to public health and safety and to make recommendations to improve that system. In developing its recommendations, the Committee recognized that the development of Alberta's sour gas resources creates a public health and safety hazard that is of concern, particularly to those living in an area of development. The Committee concluded that, in most cases, the actual risk to people and the environment associated with this hazard could be reduced to acceptable minimal levels with appropriate development planning and operation.

The Committee's approach was to review current sour gas development regulations and practices and identify gaps and areas for improvement. It recognized that the present requirements and practices are based on the state of knowledge and the operational environment existing at the time particular requirements and practices were developed. In some instances that was a number of years ago.

The Committee believes that the EUB, for the most part, has reasonably addressed public health and safety in making decisions respecting sour gas development. However, there are areas for improvement, in particular the knowledge base needs to be updated and expanded. The improvements and knowledge acquisitions addressed in the following recommendations are seen as part of applying the principle of continuous improvement, which the Committee believes is essential for an issue as important as the public health and safety aspects of sour gas development.

The Committee recognizes that Alberta currently has an extensive and comprehensive oil and gas regulatory system and that the EUB and the industry are endeavouring to ensure that sour gas operations have minimal negative impacts on the public. At the same time, as noted previously, the Committee believes that improvements must be made.

The Committee notes that positive changes have been made recently, for example changes to EUB Guide 56: *Energy Development Application Guide*. The EUB has increased its attention to enforcement and is focusing greater effort on sour gas operations. In this regard, the EUB has increased the size of its field staff. The industry has actively participated in many initiatives to address sour gas concerns, and the Canadian Association of Petroleum Producers (CAPP) has taken a lead role in implementing its stewardship program. In addition, some sour gas producers

have made changes to their sour gas procedures as part of continuous improvement. The Committee's recommendations are intended to further enhance this trend of positive change.

A number of the Committee's recommendations relate to matters that some could suggest are not exclusively "sour gas and public health and safety" issues such as communication amongst stakeholders. The Committee emphasizes that it has formulated and is directing its recommendations specifically to sour gas and its effects on public health and safety, even though it recognizes that many of its recommendations reflect principles that are applicable on a broader basis.

The Committee also notes that some of its recommendations are similar to those that resulted from an earlier process in 1993-94. Many of the earlier recommendations were not implemented, for a variety of reasons. With the benefit of hindsight, the Committee believes not to have done so was a mistake.

It should be noted that all of the recommendations in this report are numbered sequentially.

4.2 JURISDICTION AND DEVELOPMENT PLANNING

Major Driver Issue: **The need to clarify jurisdictional responsibilities and to establish coordinated surface and subsurface planning for the development of sour gas, while ensuring an effective and efficient regulatory regime.**

In addressing this major issue, the Committee deals with the following sub-issues:

- Jurisdiction
- Coordination of Surface and Subsurface Planning
- Subsurface Resource Development Planning

4.2.1 Jurisdiction

Current Situation

The jurisdiction respecting sour gas and public health and safety in Alberta is complex. The EUB is the principal regulator of oil and gas development, including sour gas. All sour gas facilities must have approval of the EUB. The EUB also regulates ongoing operations, including the inspection of facilities, and has the ability to revoke approvals or suspend operations to correct deficiencies. The EUB has a regulatory role in the prevention of sour gas releases and in response to them when they do occur.

Alberta Resource Development has responsibility for the disposition of oil and gas development rights on behalf of the people of Alberta for the more than 80 per cent of the province where the resource belongs to the Crown. In this capacity, it establishes relevant policy, issues leases, and collects royalties.

Alberta Environment has responsibilities related to sour gas and plays a major role in establishing air quality standards, and the environmental regulation of sour gas plants. The

monitoring involvement is particularly important in the event of major releases of sour gas. Alberta Environment is also responsible for licensing seismic exploratory operations.

Sour gas facilities are located in many urban and rural municipalities in Alberta. Municipal governments have a relatively minor role in their development or approval because of the responsibility of the various provincial agencies in the siting of facilities, but they have substantial emergency response responsibilities in the event of major sour gas releases.

The regional health authorities and the department of Alberta Health and Wellness have overall responsibility for the health of Albertans, including the impacts of sour gas on public health and safety. The department has a special role in setting health standards. The Regional Health Authorities Act requires that regional health authorities protect and promote the health of residents in their region. Regional health authorities and Alberta Health and Wellness are part of the overall response team in the event of major sour gas releases.

The department of Alberta Municipal Affairs, Disaster Services, has overall responsibility through the Disaster Services Act for preparing and coordinating responses to all emergencies in the province, including those related to sour gas. All municipalities are required to develop and maintain emergency response plans for response to any emergency within their area of jurisdiction.

Alberta Human Resources and Employment has overall responsibility for the Occupational Health and Safety Act. This includes requirements for workers safety as related to sour gas.

Alberta Agriculture, Food and Rural Development and Alberta Environment have a shared responsibility under the Public Lands Act. With much of the sour gas activity occurring on Crown lands, there is a responsibility associated with the numerous activities on these lands and including lease and other management agreements.

Jurisdiction respecting sour gas and public health and safety is even more complex with respect to First Nations lands. In these situations, several federal government departments including Indian Oil and Gas Canada (IOGC), and Indian and Northern Affairs Canada (INAC)) are also involved. In addition, the Indian Resource Council (IRC), in its capacity of representing First Nations with proven or probable oil and gas reserves underlying their lands, has a significant role to play on behalf of First Nations.

There is much communication among the various departments and agencies with responsibilities related to sour gas and public health and safety. As well, a number of agreements exist respecting jurisdiction and roles and responsibilities, but they do not cover all areas of potential overlap.

Findings of the Committee

Many participants in the outreach process expressed concerns about the lack of coordination among various agencies involved with sour gas development. They generally stated that the lack of a mechanism for managing the various jurisdictions results in confusion, loss of credibility, and lack of confidence in the regulatory system.

The Committee indicated in its *Directions* document that it was considering recommendations towards ensuring that the responsibilities and relationships of the various government organizations are clear, that overlaps are minimized, and that where they do exist formal working agreements are developed. The Committee also saw a need to clarify for the public and industry the roles and responsibilities of the government agencies.

The reactions to the directions of the Committee in the second round of outreach were somewhat mixed but overall supportive. Some suggested giving all of the responsibility and all of the accountability to one organization, such as the EUB. Others opposed this and pointed to the need for greater involvement of health officials. Some noted concerns respecting gaps in regulation and suggested the Committee was placing too much emphasis on overlaps.

The Committee continues to believe that the appropriate objective to strive towards is the clarification of roles, responsibilities, and accountability of the various jurisdictions, while ensuring that the overall system is both effective and efficient. Additionally, efforts are needed to ensure that the public and industry have a better understanding of the various jurisdictions.

Recommendations

1. *In its role as the principal regulator of the Alberta oil and gas industry, the EUB work with provincial and federal government departments, municipalities, regional health authorities, tribal councils, IOGC, IRC, INAC, and any other agency that has jurisdiction respecting the impacts of sour gas on public health and safety in Alberta to*

   - *clarify roles, responsibilities, and relationships respecting sour gas and public health and safety,*
   - *identify and eliminate any gaps in the system, and*
   - *identify overlaps in jurisdiction and either eliminate the overlap or develop formal working agreements to avoid unnecessary duplication and confusion as to responsibilities.*

   In this regard, the EUB should consider the designation of an individual or group within the EUB to coordinate jurisdictional matters.

2. *The working relationships established between the EUB and other involved jurisdictions (particularly the regional health authorities, municipalities, Municipal Affairs Disaster Services, Alberta Environment, and Alberta Health and Wellness) need to be strengthened to include meaningful involvement of the jurisdictions in establishing effective and efficient standards, criteria, policies, and processes for dealing with the public health and safety aspects of sour gas facility applications.*

3. *The working relationships established between the EUB and IOGC, IRC, INAC and other relevant federal government departments recognize the different jurisdictional circumstances respecting First Nations.*

4. *The EUB work with other involved parties to prepare a sour gas and public health and safety roles and responsibilities document and a summary brochure and widely distribute them to the public, industry, and other interested parties.* These documents should be

concisely written in understandable language and make clear who should be contacted to answer questions, deal with complaints and concerns, and report emergencies.

4.2.2 Coordination of Surface and Subsurface Planning

Current Situation

Alberta Environment directs an integrated resource planning process for the province. It has resulted in a series of regional sub-plans mostly in the Eastern Slopes, that consider various resources and land uses and designate areas where certain types of resource development or land uses are prohibited. Plans do not address the interface between sour gas developments and populated areas, nor potential impacts of sour gas on public health and safety.

Alberta Environment is currently leading the design of a program of "regional strategies" which are broad regional-scale planning for sustainable resource and environmental management under provincial responsibility. Regional strategies could help to address sour gas development conflicts at a broad strategic level. The program is currently at a pilot stage, so its potential is still somewhat undefined.

There is a progression of approvals and scale of review for sour gas development. Sour gas development first involves the acquisition of rights to potential sour gas-bearing formations through a public bidding process administered by Alberta Resource Development. The Crown Mineral Disposition Review Committee (CMDRC) recommends to Alberta Resource Development what, if any, restrictions should be noted pertaining to environmental concerns that can affect surface access for exploration and development of Crown mineral rights. Bidders are advised of any potential surface access restrictions during the public offering process. The CMDRC reviews proposed crown mineral leases on the basis of environmental effects. The potential effects of sour gas on public health and safety are not considered at this stage in the development process.

The acts and regulations administered by the EUB require it to review and, where judged to be in the public interest, approve the construction and operation of sour gas facilities. Other than the recommended setbacks that accompany the level classification of a sour gas facility, there is little focus on land-use designations that might exist within the municipality in question or on matters such as population density, municipal development plans, area structure plans, and other municipally approved plans. Municipalities, under the Municipal Government Act, cannot overrule an EUB decision or deny a permit to an operator if the facility is approved by the EUB, unless it is for reasons unique to the municipality which were not considered by the EUB nor covered by provincial standards.

Many of the participants in the June outreach process expressed concerns regarding the degree to which sour gas facilities exist and are being built in relatively populated areas. Several suggested that sour gas production should not be allowed near population centres (cities and recreational centres) or should be halted until technological improvements make it safer.

The Committee indicated in its *Directions* document that it was considering looking at ways to improve coordination of planning between surface developments (e.g., urban and recreational development) and the surface facilities (wells, plants, pipelines) from subsurface developments.

Reaction to the *Directions* document in this regard was generally supportive. However a number of responses raised concerns about any changes that would impact on the competitiveness and the confidential and proprietary information inherent in the current mineral leasing system.

The Committee recognizes that sour gas is widespread throughout the province and exists in many populated regions. It also recognizes that there is no way this valuable resource can be recovered without a considerable interface between sour gas development and people. The regulations that are intended to protect public health and safety from sour gas are thus of great importance. The Committee deals with these and makes many recommendations in later sections of this report.

The Committee continues to believe that even though sour gas development can safely occur in populated areas, given due care and caution, any measures that would allow the recovery of sour gas while reducing the potential impact between sour gas operations and people would be beneficial to the province. It believes that improved planning and coordination between subsurface and surface development has the potential to do this.

Recommendations

5. *The immediate formation of a task force of senior decision makers that would investigate the possibility of improving coordination between subsurface and surface planning and development.* The task force should be empowered to look at all relevant aspects of planning and development, including the mineral leasing system, and should include appropriate representation from Alberta Resource Development, Alberta Municipal Affairs, Alberta Health and Wellness, Alberta Environment, the Alberta Energy and Utilities Board, Aboriginal groups, urban and rural municipalities, regional health authorities in sour gas areas and their associations, surface land developers, the public, and the oil and gas industry. The Task Force should investigate and consider, among other matters, the following:

    - The development by the oil and gas industry, government, and urban and rural planning authorities of a complementary planning and development process. The Task Force might consider EUB Interim Directive (ID) 96-1 (regarding Hay-Zama Lake Complex – Special Requirements) as a useful precedent to assist in coordinating surface and subsurface development near populated areas, such as urban and seasonal recreational centres, as well as near First Nations and other Aboriginal lands.

    - The development of policies to ensure that sour gas reserves are delineated and recovered as soon as reasonably possible in populated areas (such as those identified in existing Inter-municipal Development Plans [IDP], designated fringe areas, or intensive transportation corridors), while still providing the industry with a reasonable opportunity to develop its mineral leases.

    - Where there are current land-use conflicts related to sour gas and public health and safety, the development of Land Use and Resource Development (LRD) Agreements by the surface and subsurface owners, relevant municipal planning authorities, and the EUB. These agreements could provide a workable solution for all parties involved in terms of development and timing. EUB Decision 2000-20, *Dynegy*

Canada Inc., Application for Pipeline Licence Amendments, is an example of how these types of agreements could be used. This might be accomplished through effective public consultation processes.

- The promotion of information exchange between industry, government, and Aboriginal people, regarding heritage (traditional lands and sacred sites), land-use planning, development, building, and emergency planning issues.

- Possible changes to the mineral leasing system. These might include matters such as leasing larger blocks of common ownership for sour gas near population centres and warnings when smaller blocks are posted that common operations are preferred; qualification criteria to ensure that operators have the necessary risk management standards and resources to handle sour gas; and notification to potential bidders of possible restrictions on resource development (such as lease time limit) in areas within or adjacent to urban centres or where land-use conflicts are relatively near-term.

- Possible restrictions on municipal development until the sour gas resources are recovered or building restrictions through land-use bylaws in areas where there is high potential for sour gas development.

- Possible modification to the existing membership of the Crown Mineral Disposition Review Committee to address the possible impacts of sour gas development on public health and safety.

4.2.3 Subsurface Resource Development Planning

Current Situation

With respect to the coordination of subsurface resource development, EUB Applications *Guide 56: Energy Development Application Guide* requires sour gas operators to conduct an assessment of nearby facilities that have the capability of handling and processing new resources in an area. In doing so, operators must attempt a reasonable degree of discussion with adjacent operators to investigate the possibility of using existing facilities and infrastructure. In addition, the EUB has a Gas Plant Proliferation Policy designed to achieve some level of coordination of subsurface planning.

While the EUB does encourage sour gas operators to look at innovative ways of mitigating a proliferation of surface facilities, there are no regulations, other than those stated above, compelling industry to use accepted techniques, such as directional drilling or pipeline corridors, to reduce proliferation. Furthermore, it appears that the EUB proliferation policy is primarily applied when there are objections to a new facility in an area.

Findings of the Committee

Many outreach participants raised public health and safety concerns respecting the number or density (proliferation) of sour gas facilities in any one area and questioned whether these were all

necessary to recover the resources. There was a general view that only the minimum amount of facilities necessary to recover the resource should be allowed.

The Advisory Committee indicated in its *Directions* document that greater effort was needed to reduce the proliferation of sour gas facilities near people. This received general support in the second round of outreach.

The Committee continues to believe that efforts should be made to improve the coordination of subsurface sour gas resource development with the aim of minimizing proliferation of the number of sour gas facilities to the extent practical. In particular, the Committee's view is that there should be a shift in onus towards the applicants to review proliferation issues and away from landowners, who under the current system are expected to raise concerns regarding proliferation of facilities.

Recommendations

6. *Adoption by the EUB of the recommendation that there be more rigid enforcement by the EUB of its gas plant proliferation policy as presented in the report recently submitted to the EUB by the Sulphur Recovery Guidelines Review Group* This Sulphur Recovery Guidelines Review report is available on the EUB's Web site at <www.eub.gov.ab.ca/bbs/products/reports/srgag-2000-04.pdf>.

7. *Revisions to EUB guides to require operators to include in their applications for critical sour wells, pipelines, and facilities a review and discussion of options to utilize existing sour gas infrastructure in the area in order to minimize the extent to which the public is impacted by additional sour gas development.* This would include both the applicant's facilities as well as other operators' facilities in an effort to reduce proliferation of well sites and sour gas pipeline infrastructure. Options may include consideration of directional drilling, target flexibility, and the establishment of pipeline corridors.

8. *Revisions to EUB guides to encourage operators to consider methods for reducing the visual and psychological impacts of sour gas facilities near people.* Options may include improved communications and relationships between the industry and the public, or buffering techniques, such as landscaping and berming, where these do not create additional hazards.

4.3 HEALTH EFFECTS

Major Driver Issue: **The adequacy of our understanding of the health effects caused by sour gas mixtures.**

Current Situation

The EUB has long relied on the appropriate departments of the Alberta Government and recognized experts in chemical toxicology to provide the acceptable limits for exposure to hydrogen sulphide (H_2S) and sulphur dioxide (SO_2). In this respect, it currently uses the 1988 table of effects of H_2S as prepared by Alberta Health and Wellness. Alberta also has stringent ambient air quality standards for H_2S and SO_2, which reflect the accepted scientific

understanding of concentrations that would not affect the health or safety of people or animals or the environment.

Regional health authorities are responsible for assessing the health of the people in their regions to determine what factors are affecting health. This information is used by regional health authorities to establish priorities and to plan for the delivery of health services, including public health services. In the case of environmental exposures, for example to sour gas, there is no routine health status monitoring, and special studies related to specific issues are carried out.

In the early 1990s, Alberta Health and the local Board's of Health identified the urgent need to strengthen environmental health services to deal with existing and future challenges, including those related to sour gas. Some regional health authorities have dedicated experts while other regional health authorities rely on ad hoc arrangements. This means that there is not a consistent response by regional health authorities to environmental health concerns raised by individual Albertans.

Findings of the Committee

The Advisory Committee, in keeping with its mandate, focused on the health effects of acute short-term exposures to sour gas. H_2S and SO_2 were the major chemical exposures that the Committee considered. There may well be health effects related to the other chemical compounds found in sour gas itself and in its combustion products when it is ignited, but H_2S and SO_2 are the two most likely to have health impacts in acute short-term exposures.

The Committee's review found a number of serious concerns about how potential health and safety issues are addressed. The Committee notes that the 1994 Public Safety and Sour Gas Advisory Committee report included a number of health and safety related recommendations that have not been acted on. In the view of the Committee, its current task would have been made much easier if the 1994 recommendations had been implemented.

The Committee heard from many members of the general public on the issue of health effects through the public outreach sessions and the telephone survey. Although the views were mixed on whether "scientists have a clear understanding about the effects of sour gas on public health," the Committee is satisfied that further work is needed in this respect. Some respondents stated that the "precautionary principle" is an important theme to be used respecting implementation of measures to reduce the impacts of sour gas on public health and safety.

Although the Committee's mandate was to review immediate or long-term effects of short-term exposure to sour gas, it heard many concerns during the outreach program about health effects of long-term exposure to low concentration levels of sour gas mixtures. Also of significant concern was the impact on human and animal health of the collective effects of multiple sour gas operations in a specific area.

The Committee in its *Directions* document indicated that more coordinated work is needed with respect to the health effects of sour gas. This was generally supported in the second round of outreach.

The Committee has little confidence in, and believes that overall there is a low level of understanding regarding the health-related information used by decision-makers in making decisions about sour gas. It further believes that a revised comprehensive health effects table should be developed as soon as possible. The one currently used was prepared in 1988. The review and table should cover both the constituents of sour gas mixtures and the products of incomplete combustion of sour gas, including SO_2, reduced sulphur compounds, and complex hydrocarbons. Alberta Health and Wellness has committed to undertake the review related to H_2S and to involve others.

The Committee believes that this revised health effects table should then provide the basis, along with the framework and methodology for dispersion modelling and probabilistic risk assessment, for a stakeholder review of EPZs as determined by the EUB. In the interim, the Committee believes the EUB should continue its current approach of using the EPZ curves developed in the early 1980s and published in *Interim Directive (ID) 97-6* for determining the size of EPZs. The Committee believes that the use of these curves is a reasonable approach to follow while the essential work is occurring on revising and updating the health effects information.

The Committee expects that the stakeholder review of the EUB approach to EPZs would consider whether the EUB's regulatory requirements should look beyond lethality and also address short- and long-term health effects. The Committee also believes that additional research work is required respecting the health effects of sour gas.

In the view of the Committee, additional effort is needed to ensure a more consistent and appropriate medical response to those exposed to high levels of sour gas, better records of the long-term health effects on such parties, and a more thorough follow-up to major sour gas releases.

Effort is also needed, due in part to jurisdictional uncertainties, to ensure that Aboriginal people are fully aware of the potential health effects of sour gas and the related regulatory requirements.

In order to address these findings and to increase public confidence and the understanding of the health effects related to sour gas, the Committee recommends that specific action be taken to 1) address the gaps in knowledge through a focused research strategy; 2) ensure that standards reflect the current knowledge about the health effects of sour gas mixtures; and 3) ensure a consistent response by health agencies, the EUB, and other involved government departments, to human health concerns, including exposure incidents. The Committee does not believe that the lack of scientific certainty should be an excuse for inaction.

Recommendations

9. *The EUB work with Alberta Health and Wellness, regional health authorities, Alberta Environment, Alberta Human Resources, industry, and other stakeholders to ensure that comprehensive health effects information (qualitative and quantitative) is developed, as soon as practical due to its urgency.* This information is needed to conduct the review of the approach to emergency response planning referred to in recommendation 58. The review should cover both the constituents of sour gas mixtures and the combustion products of sour gas, including SO_2, reduced sulphur compounds, and complex hydrocarbons. (Alberta Health and Wellness has committed to lead the review for H_2S.)

10. *The EUB, Alberta Health and Wellness, Alberta Environment, Alberta Agriculture Food and Rural Development, Alberta Research Council, regional health authorities, industry, and other interested parties including Alberta universities, jointly establish an independent Scientific Review and Advisory Committee to provide recommendations on required research programs related to sour gas and health.* This should be an ongoing activity to ensure that the research activity supports best practices by all parties. Among the tasks of this committee would be to ensure recognition and thorough assessment of completed and ongoing studies and the dissemination of the information.

11. *The EUB work with the Alberta Government to ensure financial support is available to address gaps in research respecting the health effects of sour gas.* Such research should complement the multi-government *Western Canada Study on Animal and Human Health Effects Associated with Exposure to Flare Emissions*. This research study should review the current gaps in human health research to ensure the proposed study plan addresses the relevant issues.

12. *Alberta Health and Wellness work with regional health authorities and physicians, through the Alberta Medical Association, to ensure a consistent, appropriate, and coordinated response to individuals exposed to major H_2S releases.* This should be a 24-hour, seven-day-a-week response, possibly utilizing the Poison and Drug Information Service.

13. *The EUB work with Alberta Health and Wellness and Alberta Human Resources to establish a high-level exposure registry to track individuals who have been knocked down or had other substantial exposures to sour gas.* This would enable tracking of significant human exposures to H_2S and help ensure the consistent follow-up of exposed individuals.

14. *The EUB, First Nations, Health Canada, and regional health authorities ensure there is effective communication on the health service expectations of the various parties related to sour gas in the vicinity of First Nations communities.*

15. *The EUB, industry, Alberta Environment, Alberta Health and Wellness, regional health authorities, and federal regulators, as required, ensure that there is a thorough follow-up process after major sour gas releases (such as well blowouts or pipeline failures) to determine impacts and identify opportunities for response improvement.*

4.4 TECHNICAL INFORMATION

Major Driver Issue: **The adequacy and understanding of the methods and mathematical models used in assessing potential effects on public health and safety from sour gas developments.**

Current Situation

The regulatory framework of the EUB recognizes air dispersion modelling and probabilistic risk assessment as valuable tools in predicting emissions from sour gas facilities and the potential impact they could have on the public and the environment. The EUB does not require industry to

perform hazard or probabilistic risk assessment for every sour gas application; rather it requires that the industry comply with regulatory standards established with consideration for hazard and risk assessment. Where industry chooses to perform hazard or probabilistic risk assessment to support applications, the EUB evaluates the suitability of the models and the input assumptions used.

Models can predict dispersion in air and probability of risk. However, the results of modelling are very dependent on the input information and calculation limits set in the model. Using different input data for variables like topography, meteorology, and failure statistics can result in a wide range of results.

In the late 1980s, the EUB conducted extensive research into the dispersion characteristics of sour gas and developed the GASCON2 dispersion and toxic exposure model. Field measurement testing was also done to support the model development. Many other models have been developed that are also used by industry today. The EUB is aware that improvements to modelling are ongoing. However, few resources have been committed by the EUB to remaining current with technology.

The EUB maintains databases for the collection of reservoir information, failure and release statistics, surveillance and enforcement programs. However, none is specific to sour gas and the databases are often incomplete and fragmented.

Currently most of the debate at public hearings on dispersion modelling, risk assessment, and toxicology occurs when experts, on behalf of various parties, argue the merits of methods used to predict the hazard or probabilistic risk that may be associated with a project.

Findings of the Committee

Some of the participants in the outreach process questioned the accuracy of models used to predict concentration levels of H_2S and SO_2, and suggested there was too much emphasis on risk analysis rather than on the consequences of a sour gas release. Others expressed concern that it was not appropriate to present or discuss the hazards associated with sour gas without simultaneously providing information on the probability of exposure from releases from wells or pipelines. These respondents said that it would be more appropriate to discuss the risks of sour gas, which would incorporate probability of exposure, instead of focusing just on the consequences of exposure.

The Committee believes it is important to clarify certain terms, such as hazard, risk, and probabilistic risk that are frequently used when dealing with the subject issues. These terms, as used in this report regarding public health and safety, have the following meanings:

- **Hazard**: A condition with the potential for causing an undesirable consequence. For H_2S and SO_2, it is the potential for the substances to cause adverse toxic effects at various levels of exposure.

- **Risk**: A subjective assessment of the combined hazard and likelihood of the hazard occurring.

- **Probabilistic Risk**: The measure of the combined probability (likelihood) and severity of an adverse effect on human health.

The Committee is aware that sour gas release events posing the greatest level of hazard to public health and safety rarely occur. Because these events are rare, it is necessary to rely on the use of limited available data that document actual equipment and failure events. Technical experts use the available data as input to computer models of release rates, atmospheric dispersion, and health effects to predict the effect of the sour gas industry on public health and safety.

The Committee found that the EUB's databases are not specific to sour gas, are fragmented, and do not include complete data sets. The Committee believes that it is essential for the EUB to have complete, accurate, and reliable data in order to effectively manage public health and safety.

Dispersion and risk modelling is a mixture of well-defined science within a database or computer model combined with the art of choosing which of several models to use and which release rate, terrain, and atmospheric conditions must be accounted for. There is considerable disagreement among experts and the public about the proper choices that will produce accurate, useful, and, above all, credible dispersion and risk predictions on which to base a policy of assessing and protecting public health and safety. There is no uniquely right answer to these choices, but there can be many wrong answers (e.g., erroneous calculations, inaccurate simulation assumptions and equations, impossible scenarios). The limitations as well as the capabilities of the models and methods must be well understood and communicated.

Hazard and probabilistic risk predictions often produce contradictory results that seem to be biased to strengthen the case of a particular side at a public hearing (the proponent of an application or the interveners). The Committee believes that these inevitable contradictions do not assist the industry or the public in understanding the potential probabilistic risk to public health and safety or in determining ways to improve the safety of sour gas operations. Decision-makers must be able to recognize the reasons for the differences that are debated in order to make informed decisions, which are in the public interest. Probabilistic risk assessment and hazard assessment are useful tools in scenario generation and sensitivity analysis. The essence of effective risk management is prevention of harm rather than reaction after harm occurs.

Recommendations

16. *The EUB review and organize its existing large quantity of sour gas data on well, pipeline, and facility leaks, ruptures, flares, and venting to provide a historical database that is accurate and complete, and, in conjunction with other stakeholders, urgently develop and maintain new databases that deal specifically with sour gas, and make such databases available to the industry and the public.* Databases should be accurate and comprehensive and include data on sour reservoirs, failures, release occurrences, release rates, enforcement actions, and continuous improvement. Recognizing that the databases can be only as good as the raw input data, there should be regulatory requirements that support the accuracy and submission of related information. The Committee acknowledges that implementation of this recommendation is likely to be costly in terms of initial development and continuous maintenance but believes it is critical to the process.

17. *The EUB, in cooperation with stakeholders, develop a framework and methodology for standardizing dispersion modelling and probabilistic risk assessment that will provide clarity to the industry and the public.* This would include review of existing models and defining a set of standard models and methods that will be accepted for evaluating health and safety exposure hazards and probabilistic risk from sour gas releases. Alberta Environment has developed a set of standard dispersion models for routine industrial releases that should be reviewed by the EUB.

The EUB should define the range of conditions for which each model is suited. A list of standard release, dispersion, and probabilistic risk models and a set of standardized scenarios of release rates, atmospheric conditions, and sour gas exposure effects should be made readily available by the EUB so that everyone has access to this information. These same models and methods should be suitable for assessing exposure close to the source, and evaluating policies for setbacks, emergency planning zones, and mitigation strategies, such as ignition and sheltering indoors. Where a non-standard approach to hazard or probabilistic risk modelling is brought forward by the industry or the public, the EUB should be responsible for bringing all parties together early in the process to discuss and resolve differences.

18. *The EUB require that users of sour gas hazard and probabilistic risk assessment techniques clearly state their methods and assumptions.* The sour gas hazard or probabilistic risk assessments should state the methods and assumptions in sufficient detail that a third party could duplicate the numerical results.

19. *The EUB be responsible for reviewing and updating its standard models and methods regularly.* As new techniques become available and are demonstrated to be superior, they should be adopted by the EUB. This responsibility would require the EUB to maintain the in-house expertise required to evaluate and adapt existing atmospheric dispersion and toxic risk models used by other agencies such as Alberta Environment, and other national and international agencies and researchers.

4.5 ROLE OF THE ALBERTA ENERGY AND UTILITIES BOARD

Major Driver Issue: **The adequacy of the EUB approval and regulatory systems for sour gas as they relate to public health and safety.**

The Committee, in dealing with this major issue of the role of the EUB, believes it should address the following sub-issues, each of which relates to a major function or aspect of the EUB's role:

- Regulations
- Enforcement
- Applications and Decisions
- Industry Procedures and Personnel
- Setbacks
- Emergency Response

Current Situation

The role of the EUB as it relates to public health and safety is based on the contents of many comprehensive acts, regulations, interim directives, informational letters and general bulletins, most which are listed in Appendix E, Section 4 of the *Directions* document. The regulations cover all aspects of industry activity, including exploration, construction, operations, and decommissioning of facilities.

The EUB enforces its requirements through surveillance of industry activity and application of enforcement actions for regulatory noncompliance. Initial enforcement is determined by the severity of the noncompliance matter and is escalated for repeated noncompliance or failure to respond. Enforcement involves sanctions up to and including immediate suspension of operations for major and serious non-compliance events.

EUB field inspections are prioritized based on weighting of three key criteria: operator history, site sensitivity, and inherent risk of the facility or operation. A review of the regulatory compliance history of the operator allows EUB inspectors to focus on those operators with an unacceptable level of unsatisfactory inspections, including repeat noncompliance. Sensitivity of the area where the operation is taking place is also reviewed and includes items such as proximity to the public, to water bodies, and to areas where there has previously been significant public concern regarding oil and gas operations. The inherent risk of a facility or operation is determined by reviewing specific technical details about the facility, such as well depth, complexity of the operation, and whether the facility is sweet or sour.

Applications are required for all new facilities and major modifications to existing ones, including those for handling sour gas. The EUB processes some 20,000 to 25,000 applications annually for the development of gas plants, batteries, pipelines, and wells. Approximately 2,500 to 3,000 of these are for facilities that produce, process, or carry sour natural gas.

The intent of the application process is to review the need, safety, and technical competency of the development and to ensure that all affected parties have an opportunity to learn about the project prior to approval. Should a member of the public or industry have a concern about the development, the applicant and the affected parties, sometimes with the involvement of the EUB, will work to identify and address those concerns. If the concerns cannot be resolved between the parties, the EUB will adjudicate and decide the disposition of the application at a public hearing.

The application-handling process provides for routine and nonroutine applications. If an applicant indicates that all application requirements are met and that no third-party objections exist, the application is treated as routine and approved. A selected number of applications are audited after approval has been issued. If the applicant's designation of the application as routine was based on false or misleading information, the approval may be suspended. All other nonroutine applications are subject to detailed review. A recent change to EUB policy means that that all critical sour well applications are now considered as nonroutine and reviewed in detail.

The EUB interacts with all stakeholders, including the public and industry. Much of this is through its eight field centres throughout the province and through written material respecting

the EUB, its role, and the many requirements it enforces. EUB staff investigate complaints and concerns and interact with stakeholders on these issues.

EUB regulations also apply to operators with developments on First Nations lands and Metis settlements and the EUB interacts with Aboriginal people in connection with applications, complaints, and concerns.

4.5.1 Regulations

Findings of the Committee

The EUB has a host of regulations related to essentially all aspects of the oil and gas industry, including sour gas. Some of the outreach participants, particularly from industry, suggested that the regulations respecting sour gas were in so many different sections within the regulations and that there were so many other directives or portions thereof pertaining to sour gas that it was difficult to know what the rules are. The Committee believes there should be an effort to correct this problem.

Most of the regulations-related comments received in the outreach process referred to enforcement rather than the content of the regulations. There were, however, several areas where concerns were raised that the regulations were not adequate. These included the integrity of old sour pipelines, third-party damage to pipelines, old standing sour wells, and conversion of facilities from sweet to sour operations.

The Committee is aware that the EUB does have regulations and policies related to each of these matters. These include requirements for pressure testing and corrosion inspections prior to relicensing a sweet gas pipeline to sour gas service, as well as corrosion prevention and monitoring programs for all sour gas pipelines. The Committee is also aware that the frequency of leaks from pipelines does not necessarily relate to the age of the pipelines. Notwithstanding, it does believe that special caution is needed when sour gas is involved in close enough proximity to the public to be a potential threat to health and safety.

Recommendations

20. *The EUB consolidate, to the degree possible, all of its regulatory requirements related to sour gas, and develop a single, concise document that summarizes all of its sour gas-related requirements and widely distribute the summary document.*

21. *The EUB review its requirements respecting older sour gas pipelines and the performance history of such pipelines to ensure that adequate attention is being focused on the possibility of corrosion-related or other types of leaks.*

22. *The EUB implement stronger measures to safeguard against third-party damage to sour gas pipelines.*

23. *The EUB review its requirements for approving the reclassification of sweet gas facilities to sour service and for the reactivation of older sour wells that have not been produced for ten or more years.* In particular, attention should be focused on a review of production

equipment and metallurgy, including tubulars and wellhead facilities, to ensure suitability for sour gas service.

24. *The EUB publicize the requirements to get an existing pipeline or well reclassified to sour service, in order to dispel the appearance that it is easy to do so.*

4.5.2 Enforcement

Findings of the Committee

As indicated in the *Directions* document, many outreach participants expressed the opinion that the current approach to enforcement is not working because it is not sufficiently validated through a process of EUB compliance audits. There are also concerns that the EUB is slow to respond to complaints and that there is too great a reliance on complaints as the basis for enforcement.

The direction set out by the Committee in its *Directions* document was towards greater involvement of EUB field staff in sour gas matters, particularly respecting inspections and enforcement of regulations. There was considerable support expressed for this during the second outreach process.

The Committee found that the EUB has an extensive enforcement system and publishes an annual report of the results, *EUB Field Surveillance Provincial Summaries,* but that this is not well communicated to the public. There has been a significant increase in field inspections from 1997 to 2000, nearly doubling from 3,839 to 7,340. The Committee generally supports the concept on which the current system is based, whereby the enforcement focus is on situations where problems can be most expected or where the consequences of problems would be most severe. The Committee is concerned; however, that the potential impacts of sour gas on public health and safety may not be given sufficient weight in the approach currently used by the EUB. Similarly, it is not certain that sufficient priority is given to complaints related to sour gas where public health and safety may be at risk. In addition, the Advisory Committee noted the importance of having well trained, experienced and qualified EUB inspectors as well as the importance of having clear inspection standards.

The Committee also supports the concept of an enforcement ladder as currently used by the EUB, with more severe penalties for repeat or more serious infractions. Again there is some question whether the importance of sour gas and public health and safety are sufficiently recognized in the enforcement ladder. There is also concern that the enforcement database be combined for the entire province, rather than be on the basis of the individual EUB field centres. The Committee notes that, in addition to the EUB enforcement process, Alberta Environment has an enforcement process for spills and leaks (including those with H_2S), which can result in fines.

The Committee is aware that the EUB field staff have been less involved in recent years than in past in the resolution of disputes between landowners and industry respecting sour gas operations. The Committee is concerned that the public sometimes sees this as the EUB being unconcerned about sour gas and public health and safety and believes that changes should be made.

Overall, the Committee believes that the EUB does a reasonable job in enforcing its regulations. However, it also believes that the EUB must find ways of putting even greater emphasis than is now the case on enforcing regulation of those matters where the consequences can be greatest. Public health and safety related to sour gas is one such matter. The EUB must also more clearly communicate its enforcement actions. Also, it must strive to move further towards a system that not only penalizes operators whose practices respecting sour gas are less than adequate but that provides recognition to those operators that take their sour gas responsibilities seriously and whose practices are exemplary.

The Committee recognizes that the implementation of its recommendations respecting regulations and enforcement could require greater numbers of staff in EUB field offices. It understands that the EUB is currently adding 12 positions in the 2000 – 2001 fiscal year and has plans for further additions. These additions may not be sufficient. The Committee is also of the view that to implement the spirit of its recommendations and to improve the image of the EUB as it relates to public health and safety, the required EUB staff must be experienced, well trained, and sensitive to the concerns of Albertan's respecting sour gas. Also, the Committee believes the EUB should consider locating some of its field staff closer to active sour gas operations, perhaps through the use of satellite offices.

Recommendations

25. *The EUB increase the frequency of inspections and audits and continue to conduct both arranged and unannounced inspections of sour gas operations and develop simple, practical ways of informing nearby residents of inspection and audit results.*

26. *The EUB increase inspections and audits for operators without a proven track record in sour gas operations and for those with a history of noncompliance.*

27. *The EUB inspect critical sour wells located near people at least once during or immediately prior to drilling of the critical zone and inform nearby people of the inspection results.* The inspections should include considerable focus on ensuring that the crew is adequately trained and certified.

28. *The EUB give highest priority to sour gas complaints, investigating them within one day, whenever possible, and always following up with the complainant.*

29. *The EUB field staff become more involved in landowner-operator discussions of sour gas concerns and in multistakeholders groups and assist in answering questions and resolving issues, particularly as they relate to public health and safety.*

30. *The EUB, when dealing with sour gas operations, consider alterations to the enforcement ladder to involve fewer, faster steps and more severe sanctions where there is a potential threat to public health and safety.*

31. *The EUB increase the extent to which it makes available the names of companies and the enforcement actions taken where there are major and serious infractions, as defined by the enforcement ladder, of sour gas regulations related to public health and safety.* The EUB should continue recognizing those companies with outstanding records by

appropriately reducing surveillance. It should also consider, along with industry and government, different ways in which recognition or further incentive could be provided to those whose records are exemplary and who continuously exceed expectations.

4.5.3 Applications and Decisions

Findings of the Committee

Many concerns were raised during the first outreach sessions respecting the application and decision processes of the EUB. The Advisory Committee, as a result, indicated a direction towards an increased focus on the contents and review of sour gas applications, a less formal hearing process, and more emphasis on public issues. The suggested directions were generally supported in the second outreach process.

A commonly expressed concern respecting applications was that each well, and even its flow line, is usually dealt with as a separate application and that the decision-makers do not consider the facilities that will follow. The Committee accepts that there are many constraints, such as legal requirements, lack of geological knowledge, and different owners of minerals, that push in the direction of single facility applications. It believes, however, that some changes can be made.

The Committee also believes that there can be changes to make hearings less frequent, less intimidating and more efficient when they are held, and better understood. Additionally, it is of the view that decision reports can be improved, particularly as they relate to the issues of greatest importance to the public, such as health and safety. With respect to such issues, the Committee sees a need for the EUB to ensure it has appropriate expertise available to it during the decision-making process.

Many concerns were raised that suggest that some of the public view the EUB as being biased in favour of industry and industrial development. One reason for this relates to the funding of the EUB, which is largely by industry. Another relates to its being a government agency and the view that the government promotes industrial development. The Committee believes that increased effort is needed by the EUB to address this question of the perception of neutrality.

Another area of concern that the Committee believes needs attention is the involvement of other government departments and agencies in the EUB application process and hearings. The Committee has addressed the broad matter of the relationship of the EUB with these parties in Section 4.2.1 of this report. That section states the Committee's view that these other government organizations, such as regional health authorities, should be more involved in the development of health-related policies and standards to be used by the EUB. This should minimize the need for their involvement in specific applications, but the Committee does believe that the process for their involvement, where appropriate, needs to be improved.

There were also concerns raised regarding commitments respecting sour gas and public health and safety made by applicants during negotiations and hearings that are not subsequently fulfilled. The Committee believes the EUB should be more involved in ensuring that such commitments are met.

Recommendations

Regarding the Content of Applications and Their Processing

32. *The EUB support area planning among operators and require well applications to include at least general information regarding existing and possible future area plans where sour gas is involved near people.*

33. *For sour gas near people, the EUB require project plans as part of well applications where a well is part of a larger project of the applicant and encourage applications for more than one well and facility at one time where feasible.*

34. *The EUB increase and improve coordination between itself and Alberta Environment, other involved government departments, and municipality and regional health officials.* It should develop a system that provides for their involvement in relevant EUB policy making and, where applicable, for their early, efficient, and effective involvement in the review of applications dealing with sour gas and public health and safety. This matter is also dealt with in recommendations 1 and 2.

35. *The EUB carry out a more detailed staff review of critical sour well applications immediately upon their filing and before licensing of the well. In other words, there would be no "routine" designation for critical sour well applications.* This recommendation has been adopted through a recent change to EUB policy.

36. *The EUB require information in applications for critical sour wells that demonstrates how the applicant will ensure that involved employees will be trained and certified in accordance with the standards.*

Regarding Hearings

37. *The EUB encourage mediation efforts and increase EUB staff involvement in an attempt to resolve concerns among stakeholders outside of the formal hearing process.* This may require additional trained EUB staff. The Committee is aware of the recent announcement that the EUB has approved the *Report for Implementation of Appropriate Dispute Resolution (ADR)* and suggests that the EUB monitor the use and effectiveness of this approach to determine if further initiatives are required.

38. *The EUB ensure adequate preparation time for hearings regarding sour gas facilities where there are public health and safety concerns.*

39. *The EUB increase efforts to make hearings less formal and more user friendly.* One example of how this might be done is to hold more prehearing conferences, where there is a potential to better scope the hearing, explain the hearing process to public participants, and resolve differences of views before the hearing regarding eligibility for intervener costs.

40. *The EUB rewrite its brochure,* Guide 29, *on the hearing process to make it more understandable and then make it more widely available to the public.*

Regarding Decisions and Decision Reports

41. *The EUB increase recognition of public input in decision reports and provide more descriptive material regarding the criteria used in evaluating the public interest and the manner in which surface, subsurface, individual, and other interests (including health impacts, safety, nuisance effects, and the environment) are balanced in evaluating the public interest.* The EUB should consider providing improved access to decision reports, for example through a key-word index.

42. *The EUB recognize the past performance of the applicant as an operator of sour gas facilities elsewhere in the province when making decisions respecting proposed sour gas facilities.*

43. *The EUB ensure that appropriate expertise in special subject areas, such as health and probabilistic risk assessment, is available in the form of staff, consultants, EUB Board Members, and Acting Board Members to participate in decisions and to ensure that these subject areas are appropriately dealt with in decision reports.* Given the increasing importance of health issues relative to sour gas applications, consideration should be given to appointing a medical doctor with toxicological and health impact experience as a full- or part-time EUB Board Member.

44. *The EUB record public health and safety-related commitments and undertakings given by applicants and better ensure that these are fulfilled.*

Regarding the Perception of Neutrality

45. *The EUB place greater emphasis on the need for its involved staff to be neutral when dealing with the public and industry respecting inspection results, complaints, and the resolution of concerns.* This may require special training.

46. *The EUB place greater emphasis on its role as a regulator to protect the public and provide a higher profile for its involvement in matters related to public health and safety.* One option for achieving a higher profile which might be considered, could be the creation of a public health and safety department within the EUB.

47. *The public be made aware of the clear distinction between Alberta Resource Development's role of promoting the development of Alberta's resources and the role of the EUB as a regulator that ensures that if developments are approved they take place in a manner that is in the public interest.*

48. *The manner of funding the EUB be reviewed, including a consideration of the possibility of returning the funding back to an equal sharing by the industry and government to reflect the dual role of regulating the industry and serving the public interest.* In this respect, a more conscious effort by the EUB is required to make the public aware that the contribution of the industry to the funding of the EUB is not voluntary but is a tax-like levy on production and facilities that, like any other tax, must be paid. It should also be

made clear that the funding through an industry levy does not include control over EUB operational matters.

4.5.4 Industry Procedures and Personnel

Current Situation

Industry generally has a good record of maintaining pace with technological developments and improvements as they relate to sour gas. CAPP and other industry associations take lead roles in developing recommended practices and guidelines for the upstream petroleum industry. These same associations also participate in many EUB stakeholder processes where new policy and requirements are proposed, developed, and implemented. This process was used to develop the *Alberta Recommended Practice (ARP) 1 for Drilling Critical Sour Wells*. It is noteworthy that these Alberta recommended practices are widely used internationally as standards for sour gas operations.

Industry, along with the Petroleum Industry Training Service (PITS), runs many safety-related courses. One key course is "H_2S Alive", which is an industry standard for petroleum industry workers who could be exposed to H_2S. PITS also offers training and certification in a number of drilling and well service programs, some of which are required by the EUB regulations.

For critical sour wells, specific experience requirements for supervisors, rig crew, service personnel, and safety specialists are outlined in EUB *ID 97-6: Sour Well Licensing and Drilling Requirements*. These requirements are currently being enhanced in revisions to ARP1.

A limited number of oil industry companies participate in the Alberta Government's Partnerships in Health and Safety Program. In this program, Alberta Human Resources and Employment enters into partnership with associations, corporations, and organizations that wish to take an active role in workplace health and safety.

Findings of the Committee

Many outreach participants raised concerns respecting the sour gas and public health and safety-related procedures and equipment used by industry and the personnel responsible for those procedures and equipment. Some emphasized that industry should use the best available technology, procedures, and equipment, regardless of cost.

The main areas of concern related to the training and reliability of workers and to the attitudes and philosophies of some companies' management regarding public health and safety, as well as strict adherence to EUB policies, guidelines, and regulations.

Recommendations

49. *The EUB review its requirements respecting sour gas drilling and completion, sour gas operations, and other industry practices and equipment to ensure they maintain pace with improvements in technology.*

50. *The EUB, in conjunction with industry and appropriate educational institutions, confirm or establish the necessary requirements to ensure adequate training and knowledge of sour gas workers.*

51. *The EUB, along with industry and government, investigate methods that will result in greater encouragement for all industry management to take sour gas issues and concerns more seriously and to impart this position and attitude to all company and contract personnel involved with sour gas operations.*

4.5.5 Setbacks

Current Situation

A setback is the minimum distance that must be maintained between an energy facility, such as a well, pipeline, or gas plant, and a dwelling, public facility, rural housing development, or urban centre. One important reason for the establishment of setbacks is to create a buffer zone between the energy facility and the surface development. The setbacks that the EUB uses for sour gas facilities are categorized into four levels. Minimum setback distances are reflected in a chart (see EUB *ID 81-3* and *ID 97-6*) which considers both the category of sour gas facility and the type of existing or proposed surface development in proximity to the proposed facility.

These setbacks are applied to proposed oil and gas developments as the minimum distance they must be located from existing surface developments. They are also applied to proposed surface developments as the minimum distance from existing oil and gas facilities through the Municipal Government Act.

In addition to the setbacks imposed on oil and gas facilities by the EUB and on surface developers through the planning legislation, some municipalities establish "nuisance" setbacks that are larger than those of the EUB and are related to matters like dust, noise, and visual effects. The intent of these municipality-imposed setbacks is to restrict land development near sour gas facilities. Municipalities do not, however, have the ability to reduce the minimum setback distances prescribed by the EUB.

Findings of the Committee

Some of the public participants questioned the reasonableness of the setbacks currently used by the EUB and suggested that the criteria to establish setbacks are not well understood. Although a number of those who attended public outreach sessions indicated that the setbacks for sour gas facilities are too small, many of those who responded to the telephone survey who have land affected by a sour gas setback stated that the distances are reasonable.

Some public participants commented about the effect of setbacks from sour gas facilities preventing certain types of surface developments. They questioned the fairness of these restrictions and whether some form of notification and/or compensation to landowners should be available.

The Advisory Committee indicated that it was moving in the direction of recommending that the EUB re-examine setback distances and there was considerable support for this direction in the second outreach program.

The Committee has in Section 4.4, Technical Information, recommended that the EUB develop a framework and methodology for dispersion modelling and probabilistic risk assessment. The Committee believes that this framework and methodology should form the basis for a detailed re-examination of the current sour gas setbacks, to be done through a multistakeholder process.

The effect that setbacks can have on the ability to proceed with certain surface developments is a very complex issue. The Committee believes that a possible solution requires further study and evaluation, which should be done in conjunction with the review of the adequacy of setbacks in protecting public safety.

Recommendations

52. *Once the framework and methodology for dispersion modelling and probabilistic risk assessment methodology have been developed (recommendation 17), the EUB use them as the basis for a review of the current criteria for sour gas setbacks.*

    - The review should be carried out by a stakeholder group including representatives of the relevant regulatory agencies, government departments, First Nations, Metis, municipalities, regional health authorities, the public, the land development industry, and the oil and gas industry.

    - There should be some overlap in membership with the group studying dispersion modelling and probabilistic risk assessment.

    - The review should address, among other questions, whether the current approach to setbacks is appropriate, the number of levels of categories is acceptable, and whether the actual setback distances are appropriate. It should also assess whether a common set of setback distances can be agreed upon by different jurisdictions.

    - If changes to setbacks are to occur, the stakeholder group should address the appropriate manner for handling those situations where current facilities are based on existing approvals.

53. *The EUB should initiate a review of the implications of setbacks on the ability to develop property.* The review should be carried out by the same stakeholder group noted in recommendation 52 above to review the criteria of setbacks.

4.5.6 Emergency Response

Current Situation

Operators of all sour wells, pipelines, and facilities under EUB jurisdiction are required to have an approved site-specific emergency response plan (ERP) in place prior to conducting any operation. These requirements are detailed in Sections 7.060 (9) and 9.060 of the Oil and Gas Conservation Regulation, Section 65 of the Pipeline Regulation, and in many EUB interim directives, informational letters, and industry guides. Requirements for determining emergency planning zones (EPZ) are also within these requirements. Each plan must be developed to address the specific needs of the community that could be adversely impacted in the event of a sour gas release. The plans must be updated and tested at least annually to ensure that they can be effectively implemented. The degree of detail required in an ERP depends on the hazards of the facility and the complexity of emergency response measures that may be necessary to protect the public.

In addition, all municipalities within Alberta are required, by the Disaster Services Act, to have public safety emergency response plans in place. The purpose of these ERP's is to provide a prompt and coordinated response to any emergency that takes place within a municipality's jurisdiction. The designated Director of Disaster Services for each municipality leads all emergency planning efforts and response coordination. Mutual aid agreements are also typically developed with neighboring municipalities.

Significant coordination and collaboration between industry and government is needed when an emergency occurs. The *Government of Alberta Emergency Response Support Plan for an Upstream Petroleum Incident* provides a framework for the coordination of the resources of Alberta government departments and agencies in support of the industrial operator and the local municipal authority in an upstream petroleum incident.

The EUB uses a standardized approach for initial determination of the size of the EPZ. A set of formulas and curves (EPZ curves) was developed based on dispersion modelling and field-testing. An operator is expected to use this standardized approach to determine an initial EPZ and then to modify the zone based on site-specific conditions, such as population density, terrain, and manageability. If an operator wishes to reduce the calculated zone, an application must be made to the EUB including justification for the use of the reduced zone and details of additional mitigative measures, such as immediate ignition, which will be taken to ensure public health and safety.

The ERP must include specific information regarding public protective measures that will be taken both within and beyond the EPZ, including evacuation, sheltering, and ignition criteria. The operator must describe actions that will be taken within the EPZ to ensure public health and safety for each of three predefined levels of emergency. Whenever possible, actions to protect the public must begin before there is any possibility of exposure of the public to H_2S.

Evacuation of the public is the preferred public protection measure that the operator is expected to take if there is a release when safe to do so, before a toxic release occurs, or if there is a potential for the release to continue for a long period. Evacuation of the EPZ is expected to take

place based on the actions for levels defined in the operator's ERP. The EUB requires urgent mandatory evacuation of the public if measured H_2S levels reach 20 parts per million (ppm) (3-minute average) even if this occurs outside the EPZ. The public must be notified and voluntary evacuation considered if H_2S levels reach 10 ppm (1-hour average). Notification of sensitive individuals must begin once H_2S levels reach 1 ppm (1-hour average), and voluntary evacuation may follow. In addition, notification and evacuation may be recommended at lower levels in certain situations. For example, 50 parts per billion (1 hour average) was used in suggesting voluntary evacuation and in making re-ignition decisions during a well blowout near Enchant, Alberta earlier this year.

Criteria for sheltering in the event of a sour gas release must be included in the ERP if it is to be used. Seeking shelter indoors is an acceptable alternative public protection measure to evacuation in situations where there is no advance notice of a toxic gas plume or where a release is expected to be of short duration and limited volume. This is usually the case for sour gas pipeline releases.

The operator must include specific criteria for ignition of a sour gas release in the ERP. Ignition of a source will convert the H_2S to SO_2. SO_2 is also a toxic gas, but it is dispersed higher into the atmosphere by the heat of combustion. Resulting ground-level concentrations of SO_2 are lower than those of H_2S but could cover a wider area.

The EUB requires that uncontrolled or partially controlled releases of H_2S be ignited immediately once personnel working at the site have been cleared to a safe area if any of the following occurs:

- monitoring results indicate H_2S concentrations in excess of 20 ppm (3-minute average) in unevacuated areas, or
- H_2S concentrations exceed 1 ppm (1-hour average) in urban centres or other areas where evacuation is not feasible, or
- monitoring is not taking place due to weather or other unforeseen circumstances, or
- the release cannot be brought under control in the short term, or
- evacuation of the EPZ has not been accomplished, or
- events at the source are escalating.

The EUB requires that SO_2 evacuation criteria also be included in the ERP to cover the event where a release is ignited. Currently, the SO_2 standards used by the EUB and some regional health authorities are different. The EUB minimum evacuation criteria include: mandatory evacuation if monitored SO_2 levels reach 5 ppm (15-minute average), 1 ppm (3-hour average), or 0.3 ppm (24-hour average).

The Committee is aware that two health units are using much lower SO_2 levels, based on World Health Organization guidelines, as triggers for possible actions based on potential public health issues associated with SO_2.

The EUB requires that the operator coordinate its site-specific ERP with the local municipal ERP and meet with those officials who have a responsibility for emergency response planning and/or protection of the public.

Findings of the Committee

A large percentage of participants in the outreach program raised concerns about the current ERP requirements, the approach used to determine the size of an EPZ, and emergency preparedness. These included members of the public as well as health providers, municipal representatives, and members of the oil and gas industry.

Some participants suggested that even with the current EPZ and ERP systems, improved EUB monitoring and regulatory enforcement are required to ensure public safety and health protection. Others raised concerns about the apparently arbitrary size determination of EPZs, the public's confusion or lack of understanding of calculated EPZs, the use of reduced EPZs, and whether the associated ERPs adequately cover the potential hazard area.

Some participants of the outreach process questioned the scope, effectiveness, and quality of ERPs and had associated concerns with resident information packages. Others suggested the plans should be more site-specific and some expressed doubt about the ability of some companies to effectively implement their ERPs. Other issues raised included the availability of resources, appropriate training or certification of personnel, requirements for testing and exercising of the plans, and a proper degree of coordination.

The Advisory Committee indicated in the *Directions* document a move towards strengthening EUB regulations and its role in emergency response planning to provide clearer, more prescriptive requirements. There was general agreement with this direction and considerable comment reinforcing that the EUB needed to play a more important role.

The Advisory Committee reviewed the current EUB requirements for the development, implementation, and testing of ERPs and also viewed some examples of operators' ERPs. The Committee concluded that although ERPs are generally comprehensive and well documented, improvements are needed in areas of preplanning, coordination, communication, and plan implementation.

The Committee sees the need to clarify the standards used for SO_2. Additionally, it found that little ERP planning is undertaken by the operator or required by the EUB to mitigate the effects of SO_2 release over an extended period following ignition of an uncontrolled sour gas release. Also, the term "immediate ignition" requires further definition. The Committee also noted that sheltering as a public protective measure is not well defined within the requirements and is not well understood by the public.

The Committee is aware that the EUB and industry are currently in the process of developing two new documents. The first is an EUB guide compiling all existing ERP requirements, including several enhancements, and the second is an industry companion document intended to assist industry to meet the regulatory requirements. These documents may to some extent address some of the recommendations of the Committee. The Committee believes that the completion of the documents should be delayed until the Committee's recommendations can be considered and reflected in them.

Recommendations

54. *The EUB continue its current approach of reviewing all site-specific ERPs in detail, including the criteria used to determine the size of the EPZ, and all site-specific information included in an ERP.*

55. *The EUB assess the capability of an operator to effectively implement an ERP at the time of application, and develop specific requirements to cover ERP validation through mandatory testing and exercises.* This assessment should relate to financial capability as well as the operator's access to resources required to manage an emergency situation. The EUB should take into consideration the operator's compliance record and ability and willingness to effectively coordinate, communicate, and consult with EPZ residents and emergency service providers. Additionally, operators should be required to involve other responders, such as municipal authorities and regional health authorities, in exercises at least annually.

56. *The EUB audit existing ERPs on a more frequent basis to ensure that*

- *the operator has the capability to implement its ERP,*
- *plans are updated according to requirements regarding frequency of updates,*
- *updating takes place immediately upon change of operatorship and prior to a new operator physically operating the facility, and*
- *adequate communication of updates with EPZ residents and emergency responders takes place.*

57. *The EUB require the operator to coordinate roles and responsibilities to be followed in the event of an emergency with other emergency responders through early and effective discussions with the municipal Director of Disaster Services and regional health authority's Medical Officer of Health during plan development.*

58. *The EUB review the approach it uses for determining EPZs on the basis of the health effects information (recommendation 9) and the review of dispersion modelling and probabilistic risk assessment methodology (recommendation 17).* The review of EPZs should be through a stakeholder process that includes involved government departments, municipalities, regional health authorities, the public, Aboriginal representatives, the land development industry, and the oil and gas industry. There should be some overlap in the membership of this review group and the one reviewing dispersion modelling and probabilistic risk assessment.

59. *The EUB work with Alberta Health and Wellness, regional health authorities, and other stakeholders to develop clear requirements and evacuation criteria to address the hazard of SO_2 as a result of ignition.*

60. *The EUB require industry to use the EUB's current standard approach (EPZ curves) to determine EPZs until the review of EPZs proposed in recommendation 58 is completed.*

61. *In the interim until the review of the approach to EPZs is completed the EUB not approve a reduced EPZ unless it is conditional on the immediate ignition of the well, and the EUB is satisfied that the well can be immediately ignited and kept continuously burning. The EUB must also be satisfied that the ERP adequately addresses the potential hazards to the public within the reduced zone and also within an awareness zone out to the distance of the calculated EPZ based on the current EUB approach (EPZ curves), and that a specific assessment demonstrates protection of human health.*

62. *The EUB require the operator to identify in the ERPs filed with the EUB and emergency response agencies, using dispersion modelling, the distance to where the mandatory evacuation levels for H_2S (20 ppm, 3-minute average) and SO_2 (5 ppm, 15-minute average) could be experienced.*

63. *The EUB encourage operators to establish mutual aid agreements in areas with intensive industry development and multiple operators.* This should include encouragement for operators to coordinate mutual aid with other industries (such as the forestry sector and petrochemical industries) in emergency response planning.

64. *The EUB continue its initiative to work with stakeholders to develop clear, complete, and concise guidelines and requirements for ERP development and implementation.* In doing so, the following should be considered:

- standardizing the contents and format of ERPs as much as possible, including consideration of mandatory components and terminology;
- standardizing the requirements for a specific assessment of health impacts for emergency response planning;
- including site-specific conditions of wind, topography, population distribution, access and evacuation routes, livestock management, and other community issues;
- developing accurate resident information, including determination on a self-declaring basis of special needs persons requiring evacuation assistance or those hypersensitive to sour gases; and specifying more detailed requirements for resident information packages and the timing of their availability;
- referring critical sour gas well ERPs by the EUB to relevant municipal responders and regional health authorities, at the application stage, for comment regarding response capability;
- filing approved critical sour ERPs with the EUB, municipal emergency response agencies, and other emergency responders, including mutual aid groups where they exist;

- establishing criteria for introducing a planning zone that is reduced from that determined by the EUB's standard approach, clarifying the meaning of "immediate ignition", identifying additional public protective measures to be required to ensure public health and safety, and describing roles and responsibilities of responders within the reduced EPZ, the Awareness Zone, and potentially affected areas beyond;

- annually reviewing and updating ERPs, including individual resident details and other users of land;

- establishing clear evacuation, ignition, and sheltering criteria, including criteria for when each of these measures would be considered acceptable;

- defining requirements for "post-event" debriefings and follow-up activities; and

- specifying how isolated communities and individuals (such as trappers, First Nations hunters, farmers, and transients) are planned for, including those where there is a lack of cellular coverage, which may cause communication delays.

4.6 MONITORING

Major Driver Issue: **The adequacy and coordination of public health and safety related monitoring programs for sour gas and associated pollutants, and the reporting of monitoring results.**

Current Situation

The EUB has one mobile air quality-monitoring unit, which is equipped to monitor H_2S and SO_2. The EUB uses its monitor unit for complaint response and routine compliance surveillance monitoring. The unit can also be used for emergency response monitoring but is normally on standby in the event that other responders need additional support. The EUB inspection staff is on call 24 hours per day and the monitoring unit can be deployed anywhere in the province on short notice. The EUB in many cases requires industry to hire a third party to do monitoring if complaints are received at their facilities. The results of the monitoring are then provided to the EUB for assessment. If required, appropriate enforcement or corrective actions are then implemented.

Alberta Environment has limited emergency or complaint H_2S monitoring capability, which also varies significantly from region to region. Where complaints or air quality issues are reoccurring, Alberta Environment uses its Mobile Air Monitoring Laboratory (MAML) to conduct short-term monitoring surveys in a particular area. The MAML can monitor hydrogen sulphide (H_2S), sulphur dioxide (SO_2), total reduced sulphur (TRS), total hydrocarbon (THC), reduced hydrocarbon (RHC), methane (CH_4), polycyclic aromatic hydrocarbons (PAHs), ozone (O_3), oxides of nitrogen (NO_x), carbon monoxide (CO), ammonia (NH_3) and particulate matter (PM). The EUB views Alberta Environment as the principal government responder for monitoring during emergencies. However, in general, Alberta Environment expects the EUB to take the lead in addressing sour-gas related emergency and complaint issues unless the emergency or complaint relates to a facility also regulated by Alberta Environment.

Alberta Environment also has a provincial monitoring network and monitors H_2S on a continuous basis in east Edmonton, east Calgary, Fort Saskatchewan and Red Deer. Alberta Environment maintains a wet deposition monitoring network across the province and also a number of soil plots at which soil pH and buffering capacity are measured to assess long-term impacts of acidifying emissions (i.e., SO_2 and NO_x), some of which come from oil and gas industry activities.

The Clean Air Strategic Alliance (CASA) is involved in promoting the development of regional (airshed) monitoring zones that address air quality issues that are of importance and relevance to that region. CASA is a provincial multi-stakeholder group (non-government organizations, government and industry) that examines air issues and develops recommended actions to address these issues. Under the auspices of CASA, three regional airshed-monitoring associations have been established and two additional ones are in the planning stage.

Industry in general does not have its own monitoring capabilities required to respond to emergency situations or complaints. It contracts these types of monitoring services from private companies. Operators are required to monitor and report an uncontrolled release of H_2S or SO_2 from their facilities. As well, they are required to do ambient monitoring for H_2S and SO_2 in the vicinity of their operations at sulphur recovery and flaring sour gas plants. The extent of this monitoring depends on the approved mass emission of SO_2 and the expected concentrations of H_2S and SO_2. Locations for monitors are based on the highest predicted ambient concentrations using air dispersion models. Industry in Alberta operates about 60 continuous ambient H_2S and SO_2 monitors. Industry also operates over 750 static H_2S and over 750 total sulphation monitors. The static monitors only provide information on average accumulated concentrations of H_2S and total sulphur compounds over a period of time. Industry is required to regularly submit data on ambient monitoring to the EUB and Alberta Environment.

Findings of the Committee

Outreach participants expressed concerns about the adequacy of emergency and complaint response monitoring and particularly the reporting of monitoring results. The Advisory Committee believes there should be sufficient monitoring capability, either in-house or in conjunction with other responders (e.g., industry, Health, Environment) to effectively address the main air quality and public health issues that may arise during a significant sour gas release. This response capability should be available at strategic locations throughout the province and should be quickly deployable. In addition to H_2S and SO_2, the monitoring capability should also be able to measure certain classes of hydrocarbons that may be released during an emergency/episode event.

The Advisory Committee also believes that addressing human health effects or concerns related to emergency or episodic releases of sour gas is often limited by reliable exposure data. Exposure monitors could be used during certain such events and also used in certain situations where repeat exposures to sour gas levels that are above guideline values may be occurring. Specific plans and protocols would be required as to how and when these exposure monitors would be used and how the data collected would be reported and used. The Committee believes that this type of monitoring capability can help address health concerns and issues that arise during

emergency and episodic-related sour gas releases and also help expand knowledge on the health effects associated with various exposures to sour gas-related releases.

Releases and odours associated with sour gas development often result in complaints that are based on public health and safety concerns. The EUB's single mobile air quality monitor is not considered adequate to address the number of issues and concerns that exist. The Committee believes a substantial expansion of the EUB's complaint response monitoring capability would increase public confidence that public health and safety concerns can and are being addressed. This expanded monitoring capability could be integrated with the emergency or episodic monitoring capability and also be used to do surveillance monitoring. As well, it could be used to deal with complaints related to nuisance odours and/or long-term low-level exposure concerns.

Recommendations

65. *The EUB undertake a review of the current monitoring response capabilities for events involving significant sour gas releases and ensure that adequate capability exists.* This review should include an assessment of the number, type, reliability, sensitivity, and location of the current monitoring response capability.

66. *The EUB, in cooperation with other emergency or episodic responders, ensure that the monitoring roles and responsibilities are clearly defined and that monitoring efforts and capabilities are coordinated.*

67. *The EUB, with the assistance of industry and researchers, promote and support the development of exposure monitors that can be used to measure personal exposure of the public to sour gas-related substances in a practical manner.* Guidelines would also be required as to the circumstances in which they should be used.

68. *The EUB enhance its capability to conduct monitoring as part of its complaint response and compliance programs.*

4.7 COMMUNICATIONS

Major Driver Issue: **Delivery of consistent and appropriate public consultation programs by the industry and the EUB accompanied by programs to increase public awareness and understanding of sour gas issues.**

The Committee dealt with the many communications issues under the following sub-issues:

- Public consultation
- Public awareness and understanding
- Interaction of the EUB with stakeholders.

Current Situation

In October 2000, the EUB revised its applications *Guide 56* to include increased public consultation requirements for industry. Previously some companies were only notifying the public regarding sour gas development and were not engaging the public in a dialogue regarding

proposed projects or existing operations. The EUB now expects industry to consult with the public and provide enough information to allow the public to participate meaningfully in the decision-making process.

The revised guide indicates that the EUB considers the public consultation program to be an extremely important precursor to the company filing its development application. The EUB may suspend an approval that has been routinely granted if it later finds that responses to the public involvement questions on the application were false or inaccurate.

Additionally, the EUB expects public consultation to be a regular part of an operator's business throughout the life of a project to ensure an ongoing relationship between the industry and the public.

Industry is now required by the EUB in *Guide 56* to provide the public with the following information:

a) EUB Letter to the Public: This letter explains to the public what they should expect from the company in its consultation efforts, invites the public to contact the EUB at any of its field centres or Calgary office, and provides a map of the EUB's field centres and telephone numbers.

b) EUB Guide 62: *Responding to Public Concerns about Oil and Gas in Alberta*: This booklet outlines how the EUB responds to public complaints, expectations for public notification and consultation, and new options to resolve landowner-industry disputes and provides telephone numbers of EUB staff and the EUB Web site location.

c) EUB Guide 17-2: *Well Site Selection and the Surface Landowner*: This booklet outlines the rights of the public, how well sites are selected, and what happens during negotiations and after drilling.

d) EUB Guide 17-3: *A pipeline or surface facility on my land?* This booklet outlines the landowner's rights, the application process, and the processes for selecting a location for the pipeline or facility and for negotiations and a hearing. It also identifies other agencies that may be of help to the landowner, including the Surface Rights Board, the Farmers' Advocate, the Registrar of Land Agents, and Alberta Environment.

As well, the EUB has set out what information a company is to provide to affected landholders near a proposed sour gas development. It also encourages the industry to use the *Guide for Effective Public Involvement*, published by the Canadian Association of Petroleum Producers.

With the recent change announced in Guide 56, the EUB expects the industry to

- communicate with people as early as possible to ensure that special sensitivities are addressed during project planning;

- provide full disclosure and consistent, factual information about the project and its impacts;

- discuss the potential scope of the project and how it relates to other nearby development;

- for sour gas projects, communicate with residents within an emergency planning zone during early project preparation;

- inform people about land-use restrictions that may occur because of sour gas setback requirements; and

- provide information about the regulatory process and how people may participate.

These requirements apply to Aboriginal people as well as all other Albertans.

In terms of public awareness of sour gas-related issues, the EUB and industry presently hold open houses in active sour gas areas and participate in stakeholder committees. The industry has available a number of brochures dealing with sour gas and its potential effects on public health and safety. This information and the previously mentioned consultation activities are intended for all sour gas regions in the province, including First Nations lands and Metis settlements.

4.7.1 Public Consultation

Findings of the Committee

During the public outreach process, most participants expressed concerns about the lack of consistent interaction between the public and industry to keep the public informed about operations in their area and to help resolve concerns about sour gas development. Recent changes in EUB policy in this area, as discussed above, have addressed some of the directions of the Committee. The Committee sees these changes as positive steps towards improving relationships between the industry, the public, and the EUB, but believes more can be done.

Recommendations

The Committee has the following recommendations for further improvement:

69. *The EUB establish a staff resource team that focuses on public consultation to assist industry in providing a more consistent approach to public consultation, including consultation with Aboriginal people.*

70. *The team referred to in recommendation 69 work with CAPP, training institutions and other industry associations to develop public consultation training programs that reflect EUB requirements and expectations for public consultation and that incorporate training in the practices set out in the CAPP Guide for Effective Public Involvement.*

71. *Stringent action, such as denying the application, be taken by the EUB for failure of a company to conduct effective public consultation programs.*

72. *The EUB develop a list of suggested questions to assist the public during the public consultation process.*

4.7.2 Public Awareness and Understanding

Findings of the Committee

Most participants in the outreach process expressed concern about the lack of awareness and opportunity for education regarding sour gas issues. Concerns included difficulty in accessing information, the general lack of public awareness, the uneven playing field regarding public consultation, misinformation, the lack of informed public participation in decision-making, and the issue of getting consistent, credible information.

The Committee had earlier indicated a direction towards improved understanding and awareness of potential public health and safety and sour gas-related issues on the part of the public through fair and accurate information readily available and written in understandable terms. This direction was generally supported in the second outreach.

The Committee believes changes are needed to improve the availability of unbiased information respecting sour gas and public health and safety. This may require additional communications training for those providing the information to the public. Additionally, to make the flow of information to the public and the response to concerns more efficient, better coordination is needed among operators in a particular region.

The consultation process often involves information respecting the benefits of sour gas development. Concerns were raised that suggested that many of the benefits accrue to the province as a whole and that the local or regional share of those benefits do not justify the risks and other negative impacts. The Committee believes this should be addressed.

Recommendations

73. *Formation of an information office located within the EUB and supported by a stakeholder committee, to provide accurate, reputable, neutral information related to sour gas development and to be a key contact for referring the public to sources of additional relevant, reputable information.* The objective would be to work toward building trust and understanding among industry, the public, and the EUB and to liaise with stakeholder groups throughout the province. The existence of this information office and its role should be widely publicized and the office should be easily accessible to the public. Advertising could possibly take place through distribution of initial information packages provided to the public during public consultation and through EUB field centres and the EUB Web site.

74. *The EUB initiate, in conjunction with industry and training institutions, the development of effective communications training programs for those individuals responsible for communicating with the public respecting technical aspects of sour gas.* Examples of programs would include risk communication methodology and emergency response consultation.

75. *The EUB conduct information sessions, workshops, and panel discussions involving the public, industry, and other stakeholders specifically focusing on raising awareness and*

understanding of sour gas developments, rights of surface and subsurface owners, and how the EUB determines the public interest in making decisions on applications.

76. *The EUB prepare material providing clear, understandable information on technical matters such as ERPs, EPZs, setbacks, rights of surface and subsurface owners, risk communication, and hazard and risk assessment.*

77. *The EUB field centres identify key operator contacts, telephone numbers, and locations of facilities and provide this information to the public in order to enable them to more efficiently contact appropriate industry officials regarding a development in their area, if they require information or have concerns.* This information would need to be updated regularly and the public advised of changes.

78. *The EUB encourage the development of mutual aid agreements where there are multiple operators in an area.* This is also addressed in recommendation 63. Consideration should be given to having one central contact for the public to contact respecting information requests, concerns, or complaints, rather than members of the public having to determine the operator responsible for the facility relating to the query.

79. *The EUB initiate a study involving industry, government, the public, and municipal representatives to determine the nature of local benefits, such as reduced property taxes and local business opportunities, to communities impacted by sour gas development.*

4.7.3 Interaction of the EUB with Stakeholders

Findings of the Committee

The outreach processes revealed that the role of the EUB is unclear to some of the public and that some question its credibility as a neutral regulator. The Committee in its *Directions* document indicated that it was moving towards actions to increase public understanding of the role of the EUB and to improve client service. This was broadly supported in the second outreach process.

The Committee is of the view that the EUB needs to be more proactive about its role, particularly respecting sour gas and public health and safety. This might involve upgrading printed material to make it more readily understandable and improving the availability of such material, including by electronic means. It might also involve the need for more specialized training for certain staff or other organizational changes. In the judgement of the Committee, improved interaction over the long term can only come from developing and nurturing sound relationships between the EUB and its stakeholders.

The Committee believes it is important that those presenting information to stakeholders on behalf of the EUB and representing the organization also be those who are involved with the regulation of operations and with the public on a daily basis. This may require special training of field staff or others in such positions.

Recommendations

80. *The EUB put greater emphasis on developing relationships with all of its stakeholders.* This might involve the holding of more EUB open houses, making staff more readily available to participate in meetings of concerned citizens, and making presentations about its role to interested groups throughout Alberta. This is also addressed in recommendation 75.

81. *The EUB develop a brochure for the public that focuses on the role of the EUB and provides contact names and phone numbers to be given out when industry does public consultation.* It should also be widely distributed to all interested parties, such as municipalities, and posted on the EUB Web site. The brochure must be clear and succinct and be kept up to date. Consideration should be given to having a brief summary brochure for those with limited interest and a more detailed one for those with greater interest.

4.8 ABORIGINAL (FIRST NATIONS AND METIS) ISSUES

Major Driver Issue: **Lack of awareness and understanding among Aboriginal people regarding sour gas related issues and the role and relationship between the EUB and other relevant provincial and federal departments including Health Canada and Indian Oil and Gas Canada.**

Current Situation

The area of jurisdictional responsibility as it relates to First Nations is a complex issue. Nonetheless, the EUB applies and enforces all of its regulations on First Nations lands and Metis settlements, and in the case of First Nations, in cooperation with Indian Oil and Gas Canada.

Findings of the Committee

Essentially all of the findings and recommendations proposed by the Advisory Committee throughout this report are common to both the general public and the Aboriginal people. However, some of the issues the Committee has dealt with are unique to First Nations communities. In these instances, the resulting recommendations are developed and presented in this section. Additionally, for the convenience of Aboriginal people, the Advisory Committee has repeated in this section all the recommendations that relate to Aboriginal people and appear elsewhere in the report.

It was clear, from the many meetings held by the Advisory Committee with Aboriginal people that the EUB is not well known among First Nations and Metis. Furthermore, the views of First Nations and Metis regarding sour gas issues are not well known to the EUB. To address this, the Committee indicated directionally that the EUB should be more involved with Aboriginal people as members of the Alberta public whose safety and health may be impacted by sour gas. This direction received widespread support in the second round of outreach.

The Committee believes the EUB must improve its relationship with Aboriginal people, not only regarding sour gas development and its potential impact on health and safety, but also with respect to all other regulatory matters. The relationship must recognize issues of special importance to First Nations people, such as their traditional lands and sacred sites.

The multiple federal jurisdictions applicable to First Nations (e.g., Indian and Northern Affairs, Indian Oil and Gas Canada, Health Canada) and their relationship to the EUB and other provincial agencies are often unclear. The jurisdiction is further complicated by the issue of the traditional use of lands outside of the specific boundary of reserves. The matter of identifying and delineating traditional lands of various First Nations is beyond the scope of the Advisory Committee as well as the EUB and is better defined through political processes.

The Advisory Committee found that communication and consultation by industry with First Nations and Metis is, at times, inconsistent, in part due to lack of understanding by industry of Aboriginal lifestyle, as well as internal protocol within First Nations or Metis communities.

The Committee has concluded that the First Nations are often ill prepared to deal with coordinated emergency response planning due to lack of adequate infrastructure and knowledge of disaster service processes. Although industry, in preparing emergency response plans that overlap First Nations lands are required to coordinate planning and preparedness with the Aboriginal communities, they seem to receive inconsistent support from within the communities due in part to the reasons noted above.

Additionally, in more remote areas, First Nations and their respective land bases are not recognized for the diffuse nature of housing. As a result, formalized consultation is often relegated to the "village" site only. Also, due in part to the multi-jurisdictional regulatory overlap, complaint and incident response, as well as air quality monitoring, are often lacking, especially where sour gas facilities are outside of but in general proximity to First Nations lands.

Recommendations

The Advisory Committee has the following recommendations that are unique to the Aboriginal communities:

82. *The EUB engage appropriate staff, including First Nations persons, to ensure more interaction among the EUB, Aboriginal people, and industry (including contractors).* These staff would ensure that cultural awareness sessions are conducted for EUB staff and that informational sessions are conducted for Aboriginal people, specifically focusing on building understanding of sour gas development. Important issues to be addressed include isolated communities, communications systems, and language barriers.

83. *The EUB consider forming an Aboriginal advisory committee or a series of regional advisory committees to better ensure that Aboriginal issues are recognized.* Consideration should also be given to ad hoc committees to deal with specific issues.

84. *The EUB work with federal and other government departments to ensure that the relationship among federal and provincial government departments, First Nations and Metis communities, and adjacent municipalities is clear, that gaps in regulation are*

eliminated, and that areas of overlap are handled efficiently through the necessary agreements. This matter is also dealt with in recommendations 1 and 3.

85. *The EUB ensure the existence in First Nations and Metis communities near sour gas developments, of a good complaint and incident response program that would have monitoring capability and surveillance and monitoring programs that provide good information on general air quality.*

86. *The EUB strictly apply its existing requirements that industry conduct timely and meaningful public consultation in and around First Nations lands and Metis settlements.*

87. *The EUB work with Indian and Northern Affairs Canada (INAC), Health Canada (regarding First Nations), and Alberta Municipal Affairs (regarding Metis Settlements) to provide adequate infrastructure and resources to the First Nations and Metis for planning and development of disaster services capability.*

The planning should include the following matters:

a) identification of overlap between plans;

b) understanding of the roles of all parties, particularly as they relate to evacuation procedures;

c) effective communication in the case of emergencies with the First Nations and Metis if they are in the affected region, even if outside of the EPZ;

d) identification of resources needed for the development and implementation of disaster plans and/or perhaps a disaster office or a disaster fund; and

e) development of mutual aid agreements.

The following recommendations are taken from other sections of the report and are repeated for the convenience of the Aboriginal peoples.

1. *In its role as the principal regulator of the Alberta oil and gas industry, the EUB work with provincial and federal government departments, municipalities, regional health authorities, tribal councils, IOGC, IRC, INAC, and any other agency that has jurisdiction respecting the impacts of sour gas on public health and safety in Alberta to*

- *clarify roles, responsibilities, and relationships respecting sour gas and public health and safety,*
- *identify and eliminate any gaps in the system, and*
- *identify overlaps in jurisdiction and either eliminate the overlap or develop formal working agreements to avoid unnecessary duplication and confusion as to responsibilities.*

In this regard, the EUB should consider the designation of an individual or group within the EUB to coordinate jurisdictional matters.

3. *The working relationships established between the EUB and IOGC, IRC, INAC, and relevant federal government departments, recognize the different jurisdictional circumstances respecting First Nations.*

5. *The immediate formation of a task force of senior decision makers that would investigate the possibility of improving coordination between subsurface and surface planning and development.* The task force should be empowered to look at all relevant aspects of planning and development, including the mineral leasing system, and should include appropriate representation from Alberta Resource Development, Alberta Municipal Affairs, Alberta Health and Wellness, Alberta Environment, the Alberta Energy and Utilities Board, Aboriginal groups, urban and rural municipalities, and regional health authorities in sour gas areas and their associations, surface land developers, the public, and the oil and gas industry. The Task Force should investigate and consider, among other matters, the following:

- The development by the oil and gas industry, government, and urban and rural planning authorities of a complementary planning and development process. The Task Force might consider EUB Interim Directive (ID) 96-1 (regarding Hay-Zama Lake Complex – Special Requirements) as a useful precedent to assist in coordinating surface and subsurface development near populated areas, such as urban and seasonal recreational centres, as well as near First Nations and other Aboriginal lands.

- The development of policies to ensure that sour gas reserves are delineated and recovered as soon as reasonably possible in populated areas (such as those identified in existing Inter-municipal Development Plans [IDP], designated fringe areas, or intensive transportation corridors), while still providing the industry with a reasonable opportunity to develop its mineral leases.

- Where there are current land-use conflicts related to sour gas and public health and safety, the development of Land Use and Resource Development (LRD) Agreements by the surface and subsurface owners, relevant municipal planning authorities, and the EUB. These agreements could provide a workable solution for all parties involved in terms of development and timing. EUB Decision 2000-20, *Dynegy Canada Inc., Application for Pipeline Licence Amendments*, is an example of how these types of agreements could be used. This might be accomplished through effective public consultation processes.

- The promotion of information exchange between industry, government, and Aboriginal people, regarding heritage (traditional lands and sacred sites), land-use planning, development, building, and emergency planning issues.

- Possible changes to the mineral leasing system. These might include matters such as leasing larger blocks of common ownership for sour gas near population centres and warnings when smaller blocks are posted that common operations are preferred;

qualification criteria to ensure that operators have the necessary risk management standards and resources to handle sour gas; and notification to potential bidders of possible restrictions on resource development (such as lease time limit) in areas within or adjacent to urban centres or where land-use conflicts are relatively near-term.

- Possible restrictions on municipal development until the sour gas resources are recovered or building restrictions through land-use bylaws in areas where there is high potential for sour gas development.

- Possible modification to the existing membership of the Crown Mineral Disposition Review Committee to address the possible impacts of sour gas development on public health and safety.

14. *The EUB, First Nations, Health Canada, and regional health authorities ensure there is effective communication on the health service expectations of the various parties related to sour gas in the vicinity of First Nations communities.*

52. *Once the framework and methodology for dispersion modelling and probabilistic risk assessment methodology have been developed, recommendation 17, the EUB use them as the basis for a review of the current criteria for sour gas setbacks.*

- The review should be carried out by a stakeholder group including representatives of the relevant regulatory agencies, government departments, First Nations, Metis, municipalities, regional health authorities, the public, the land development industry, and the oil and gas industry.

- There should be some overlap in membership with the group studying dispersion modelling and probabilistic risk assessment.

- The review should address, among other questions, whether the current approach to setbacks is appropriate, the number of levels of categories is acceptable, and whether the actual setback distances are appropriate. It should also assess whether a common set of setback distances can be agreed upon by different jurisdictions.

- If changes to setbacks are to occur, the stakeholder group should address the appropriate manner for handling those situations where current facilities are based on existing approvals.

53. *The EUB should initiate a review of the implications of setbacks on the ability to develop surface lands.* The review should be carried out by the same stakeholder group noted in recommendation 52 above to review the criteria of setbacks.

64. *The EUB continue its initiative to work with stakeholders to develop clear, complete, and concise guidelines and requirements for ERP development and implementation.* In doing so, the following should be considered:

- standardizing the contents and format of ERPs as much as possible, including consideration of mandatory components and terminology;

- standardizing the requirements of a specific assessment of health impacts for emergency response planning;

- including site-specific conditions of wind, topography, population distribution, access and evacuation routes, livestock management, and other community issues;

- developing accurate resident information, including determination on a self-declaring basis of special needs persons requiring evacuation assistance or those hypersensitive to sour gases; and specifying more detailed requirements for resident information packages and the timing of their availability;

- referring critical sour gas well ERPs by the EUB to relevant municipal responders and regional health authorities, at the application stage, for comment regarding response capability;

- filing approved critical sour ERPs with the EUB, municipal emergency response agencies, and other emergency responders, including mutual aid groups where they exist;

- establishing criteria for introducing a planning zone that is reduced from that determined by the EUB's standard approach, clarifying the meaning of "immediate ignition", identifying additional public protective measures to be required to ensure public health and safety, and describing roles and responsibilities of responders within the reduced EPZ, the Awareness Zone, and potentially affected areas beyond;

- annually reviewing and updating ERPs, including individual resident details and other users of land;

- establishing clear evacuation, ignition, and sheltering criteria, including criteria for when each of these measures would be considered acceptable;

- defining requirements for "post-event" debriefings and follow-up activities; and

- specifying how isolated communities and individuals (such as trappers, First Nations hunters, farmers, and transients) are planned for, including those where there is a lack of cellular coverage, which may cause communication delays.

69. *The EUB establish a staff resource team that focuses on public consultation to assist industry in providing a more consistent approach to public consultation, including consultation with Aboriginal people.*

4.9 NONMANDATE BUT IMPORTANT ISSUES

There were a number of matters related to sour gas and public health and safety that were excluded from the mandate of the Advisory Committee because other initiatives were already dealing with the matters. Some of the concerns raised by participants in the outreach process related to such matters. Participants also raised concerns respecting other matters not related to sour gas. All of these nonmandate concerns are reflected in Appendix C, so that those responsible can have regard for them.

The Committee believes that some of these nonmandate issues are of such importance that it wishes to comment on them. The comments reflect the input during the outreach processes and the Committee's own views. They are directed generally to the EUB. In the case of those issues excluded from the mandate because other initiatives are already in place, the comments are also directed to those responsible for these initiatives.

The nonmandate but important issues that the Committee believes it should comment on are

- Flaring
- Monitoring of long-term low levels of H_2S or SO_2
- Research on health effects from long-term low-level exposures
- Protection of groundwater
- Compensation
- Intervener funding
- Seismic exploration activities

4.9.1 Flaring

Many participants in the outreach process raised concerns regarding flaring. Although most of the concerns appeared to relate to the flaring of sour gas and potential impacts on health, some simply dealt with the degree to which flaring is allowed in the oil and gas industry in Alberta.

The Committee is aware of the Clean Air Strategic Alliance (CASA) flaring project team, its work to date, its plans for further work, and industry's performance in terms of exceeding flaring reduction targets to date. The Committee is very supportive of what this multi-stakeholder project team has accomplished to date and believes that the reduction in flaring will be increasingly recognized by the public. It is of the view that continued emphasis should be placed on the elimination of the flaring of sour gas close to residences.

The Committee notes that CASA's effort has resulted in a requirement that all solution gas flares within 500 metres of a residence must be evaluated by the end of the current year (2000) and that the remaining solution gas flares must be evaluated prior to the end of 2002. The evaluation must assess the elimination or reduction of such flares and, in those cases where a flare is still required, validation that the flare meets the required performance standards. The results of this evaluation must be provided to residents within 500 metres of the flare. It is the Committees understanding that the EUB will monitor the results of the evaluations and will be the deciding party when disputes exist between the operator of the flare and nearby residents.

The Advisory Committee considers this to be a reasonable requirement and approach. In resolving any disputes regarding the management of flares where sour gas is involved, it encourages the EUB to take a strong position and either require the elimination of the flare or the adoption of technology that will better ensure complete combustion of the sulphur compounds in the flare gas.

4.9.2 Monitoring of Long-term Low Levels of H_2S or SO_2

A number of participants in the outreach process commented on monitoring. Some of these comments related to the monitoring of low levels of H_2S and $S0_2$ that may exist over long periods of time. The EUB did not include the effects of such exposures on public health and safety in the mandate of the Committee because a proposed major research study, *The Western Canada Study on Animal and Human Health Effects Associated with Exposures to Flare Emissions,* is intended to address such matters.

The Committee is of the view that the research work should include considerable emphasis on the possible effects on human health of long-term low-level exposure to sour gas. In order to carry out such research in a manner most beneficial to concerned citizens, the Committee believes those responsible for planning and conducting the research should review the current gaps in human health research and consult with stakeholders. In concert with this research the EUB should work with all stakeholders to ensure that there is a surveillance and network-monitoring program to provide good information on air quality in areas with significant sour gas development. To the extent possible, this should be done in concert with the CASA regional airshed monitoring programs, as described in Section 4.6 of this report.

Additionally, the Advisory Committee is aware that complaints are often lodged with the EUB or Alberta Environment related to odours and other long-term effects of low levels of H_2S or SO_2. To ensure that these can be properly responded to, the Committee believes there must not only be adequate monitoring capability to deal with acute exposures resulting from emergencies or incidents (as recommended in Section 4.6), but also reasonable monitoring capability to respond to complaints that relate to chronic long-term exposure.

4.9.3 Research on Health Effects from Long-Term, Low-Level Exposures

As indicated previously, many participants in the outreach process raised concerns about the possible health effects of long-term exposure to low levels of H_2S, SO_2, or other sulphur compounds. Indeed, this is one of the major concerns raised by outreach participants, and a number were critical of and sceptical about the reasons for excluding this matter from the mandate of the Committee.

The Committee understands that a major research project, *The Western Canada Study on Animal and Human Health Effects Associated with Exposure to Flare Emissions,* is proposed to be under way shortly. It has reviewed the material publicly available respecting the intended research and it notes that there appears to be little emphasis on the effects of sour gas on humans, particularly resulting from long-term low-level exposures.

The Committee has the following comments for the Board that will direct the research project. One comment is that there should be appropriate emphasis on research related to the health effects of sour gas on humans, particularly from exposures over the long-term at low levels. In this respect, the Committee believes the project should consider developing linkages with the regional health authorities in sour gas areas and with any health-related research committee established as a result of the recommendations in this report.

The other comment relates to communications. The Committee heard from a number of concerned citizens who make an effort to know what is happening respecting sour gas and public health and safety, but who had no knowledge of the research study. As this study is a matter of great interest, with many potential benefits to the broad public, the Committee believes that those responsible for it should more extensively publicize the research plans and then the results of the research when they become available.

4.9.4 Protection of Groundwater

The Committee heard many comments about the impacts of the oil and gas industry, including seismic exploration, on groundwater. Some of the comments did relate to sour gas in that the concerns were about the impact of leaking chemicals and sulphur from blocks at sour gas plants on the groundwater system.

The Committee is aware that several provincial government departments are in the preliminary stages of developing a provincial groundwater strategy. Alberta Environment is taking responsibility for creating a framework for development of this integrated strategy. The Committee draws to the attention of the strategy group that the manner of groundwater remains very important to Albertans living in areas of intense oil and gas development. The latter group has many concerns and seems generally unaware of the steps being taken to protect groundwater.

The Advisory Committee believes that those responsible for the groundwater strategy should, at the appropriate time, make their plans better known to the public so that all views will be recognized in developing and going forward with efforts to protect groundwater quality and quantity in the province.

4.9.5 Compensation

Many of the comments from participants in the outreach process related to compensation paid to landowners by the oil and gas industry for various negative impacts. A few of the comments were specific to sour gas and the system for compensation when residents are affected by a major release and are evacuated. This matter is excluded from the mandate of the Committee because it is currently being handled through a stakeholder initiative to revise EUB *Informational Letter (IL) 89-20*.

Some of the comments that the Committee heard were related to the issue of compensation for the negative impacts on livestock and the difficulty in handling such matters. In this respect, the Committee is very supportive of a recently initiated animal health complaint and investigative procedure that has been organized by Alberta Agriculture, Food and Rural Development, Alberta Environment, the Alberta Cattle Commission, and the EUB, working together with industry. It

establishes a protocol and procedures for assessing possible impacts on animal health from oil and gas operations and resolving disputes over related compensation.

Additionally, the Committee was clearly reminded throughout the outreach process that the broad matter of compensation is a significant issue to many in sour gas areas. The Committee has the following comment for those government departments involved in the compensation system and for the industry.

The public sees compensation as one element of the total picture of the oil and gas industry and government policy towards it. If the public views compensation or any other important element as unfair and inadequate, this affects its overall view and reaction to the industry. It therefore seems to the Committee that those responsible for the total oil and gas compensation system in Alberta should, first, ensure that the system is fair and equitable and, second, make an effort to ensure that the broad public understands the system, the reasons why it is structured the way it is, and the checks and balances that ensure it remains fair to all parties.

4.9.6 Intervener Funding

The Committee heard some comments respecting intervener funding. This matter was excluded from the mandate of the Committee because a separate stakeholder initiative was going forward, entitled *The Review of Costs Procedures for Energy and Utility Proceedings*. The Committee has some comments that arise from the input it received respecting intervener funding and appearances at EUB hearings to deal with matters of public health and safety.

Some participants believe the definition of a "local intervener" for cost purposes is too limited when it comes to public health and safety because health effects on humans can extend beyond the boundaries typically used by the EUB in deciding eligibility for costs. One situation when this might occur is when a municipality intervenes at a sour gas facility hearing and requests that a larger than standard setback distance be used or perhaps suggests that it might impose a larger one. In this situation, a landowner beyond the normal setback distance but within that requested by the municipality may feel compelled to be at the hearing to protect its interests. Similarly, where an applicant requests an emergency planning zone (EPZ) reduced from that calculated in the normal fashion, the landowner beyond the requested reduced zone but within the calculated area may wish to be at the hearing.

Following a hearing, the EUB typically awards costs only to those who are within the setback or EPZ as set by the EUB in the decisions. This could exclude landowners who believed they had a legitimate reason to participate as a local intervener eligible for costs.

In the view of the Advisory Committee, the EUB should consider landowners who intervene in such cases to be intervening with respect to lands that may be directly and adversely impacted by the applied-for facility and therefore be eligible for costs.

Another area of concern relates to the uncertainty of eligibility for costs. Since eligibility is typically not decided until after a hearing, sometimes the public must put up its own funds for studies it believes necessary with no assurance it will be eligible for costs. Some see this as an effort by the EUB to reduce the number of public interventions. Efforts should be made to

resolve disputes about eligibility for costs and indeed the type of studies that will be funded prior to hearings wherever possible.

The Committee also agrees with suggestions raised by a few participants in the outreach program that the EUB should more frequently allow costs when there has not been a hearing because the hearing was not needed as a result of intensive and time-consuming negotiations between landowners and an applicant. The Committee notes that the recent approval by the EUB of Appropriate Dispute Resolution (ADR) should address this matter, because, presumably, one of the first issues addressed in an ADR process would be the matter of costs.

4.9.7 Seismic Exploration Activities

Seismic activity is a fundamental exploratory system extensively used in Alberta. It is not regulated by the EUB, but by other government departments, including Resource Development and Environment. It is clearly not specific to sour gas and public health and safety, but the Committee heard so much on the subject that it offers the following comment.

Seismic activity is often the first contact the public has with the oil and gas industry. Many of the comments the Committee received suggest that this first contact is frequently poorly handled by those responsible for seismic activities. When serious problems occur during this phase, they may result in a relationship between landowners and the industry based largely on distrust and a feeling that the industry is unregulated. The latter is in part because the myriad of oil and gas operating regulations do not apply to seismic activities.

Efforts are needed by the industry and government to recognize that seismic activities should be conducted in a manner that is fair and thoughtful towards landowners. This will in many cases improve the ongoing relationship between the public and the industry by, for example, improving confidence that the industry and government do care about and protect the health and safety of the public.

Public Safety & Sour Gas

Provincial Advisory Committee on Public Safety and Sour Gas

December 2000

FINAL REPORT: APPENDICES

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APPENDIX A

ADVISORY COMMITTEE MEMBERSHIP

Members	Constituency Represented
Gerry DeSorcy	Chairman
Marilyn Craig	Secretariat
Paul Jackson	Public-at-large
Brian Winter	Public-at-large
Judith Bugg	Public-at-large
Doreen Healy	Aboriginal Relations
Brent Friesen	Regional Health Authorities
Bart Guyon	Alberta Association of Municipal Districts and Counties
Barry Virtue	Alberta Urban Municipalities Association
Marjorie Young	City of Calgary Administration
Randy Gossen	Oil and Gas Industry
Frank George	Oil and Gas Industry
John Squarek	Oil and Gas Industry
Bob Clark	Land Development Industry
Robert Ollerenshaw	Land Development Industry
Kevin McLeod	Alberta Health and Wellness
David Spink	Alberta Environment
Maureen Bolen	Alberta Agriculture, Food and Rural Development
Cindy Miller Reade	Alberta Municipal Affairs, Local Government Services
Ron Wolsey	Alberta Municipal Affairs, Disaster Services
Dan Clarke	Alberta Human Resources and Employment
Steve Hrudey	University Risk Research
David Wilson	University Risk Research

ADVISORY COMMITTEE ON PUBLIC SAFETY AND SOUR GAS
BIOSKETCHES

Gerry DeSorcy — Chairman

Gerry DeSorcy is a Regulatory Consultant with 45 years' experience at technical and administrative levels. He spent 38 years with the Alberta Energy and Utilities Board (EUB) and the Natural Resources Conservation Board (NRCB), where he was extensively involved in policy development and application of policies regarding technical, conservation, business, and environmental issues and sustainable development. He worked at many levels throughout the EUB organization dealing with all aspects of regulation and was Chairman and Chief Executive Officer at the time of his retirement.

Since his retirement from the EUB, Mr. DeSorcy has consulted on a variety of general, legal, policy, and technical oil and gas and environmental regulatory issues for governments and private companies in Canada and elsewhere. In this capacity, he has provided advice on the development of a number of regulatory systems. Mr. DeSorcy also developed and presented in a credit course on oil and gas regulation at the University of Calgary.

Paul C. Jackson — Public-at-Large

Mr. Jackson is a Professional Geologist with 32 years of oil and gas exploration experience, including many sour gas exploration projects. After working with Amoco Canada and Canadian Hunter and as Vice President of Exploration for Co-enerco, he began his own consulting company.

Recently, Mr. Jackson served as cochairman of a public intervention group concerned with a sour gas well proposal. He is currently involved in a multistakeholder review group dealing with an EUB conditional decision. He is also an active community participant and is the current President of the Bearspaw-Glendale Community Association. Mr. Jackson's exploration background, experience as an intervener, and community experience, as well as his rural upbringing, place him in a unique position to contribute as a member of the public to the Advisory Committee.

Brian Winter — Public-at-Large

Mr. Winter is currently the Fire Marshall and Director of Disaster Services for the Town of Cochrane. He has worked in the emergency response field for 25 years. Mr. Winter began working for the Town of Cochrane in 1979 and has served as the town Fire Chief for 16 years. He has a keen interest in disaster planning and was very involved with the 1988 Calgary Olympic Disaster Plan.

Mr. Winter is the founding member of the Cochrane Operators Pipeline Committee, which meets monthly to discuss and promote safety in the Cochrane area. His fire safety knowledge has contributed to the promotion of a safe environment in Cochrane. He has also has testified as an expert witness in a number of court cases dealing with arson fires. Mr. Winter has a kinesiology degree (University of Calgary) and a Diploma in Emergency Paramedical Care (Southern Alberta Institute of Technology).

Judith Bugg — Public-at-Large

Ms. Bugg has extensive and varied experience working with the public. As a volunteer, she has been involved with Safe Grad programs, minor hockey, and figure skating, as well as serving as Treasurer for the Yellowhead Reform Party Constituency Association and Office Manager for Cliff Breitkreuz, M.P., in the 1997 federal election campaign.

Her professional background has included employment as a secretary for the principal of an elementary school, tax preparation, bookkeeping and financial consulting with an accounting firm, co-owner and operator of a sheet metal business, farming, manager of Sylvan Lake Housing Authority, and Constituency Assistant for Cliff Breitkreuz, M.P.

Ms. Bugg was raised on a farm in Central Alberta. She and her husband now live in Edson, where they have developed a full-time cow/calf operation and raise paint horses and elk.

Randall G. Gossen — Oil and Gas Industry

Dr. Gossen is an oil and gas industry executive with 26 years of experience in the industry. His oil and gas experience has included 14 years with Imperial Oil Ltd., a two-year secondment to the federal department of Energy, Mines and Resources, and his current role as Division Vice President for Environment, Health and Safety at Canadian Occidental Petroleum Ltd. Dr. Gossen's extensive volunteer commitments include Chairman of the Business and Environment Advisory Board of the Conference Board of Canada, a past Board Member and Vice Chairman of the Arctic Institute of North America, a member of the Environment Committee of the Board of the Calgary Airport Authority, a past Co-chair and Director of the Alberta Ecotrust Foundation, a Director of the Environmental Law Centre, and a founding member of the Environment Committee of the Alberta Professional Engineers, Geologist and Geophysicists Association. Dr. Gossen has recently coordinated industry participation in the development of a new Chair in Risk Communication at the University of Calgary.

Prior to his career in oil and gas, Dr. Gossen worked as a biologist with the Colombian government. Upon graduation with a Ph.D. in soil microbiology from the University of Calgary in 1973, Dr. Gossen spent four years with Canadian Arctic Gas Study Ltd. with responsibility for directing the environmental studies for the proposed northern pipeline, including a two-year assignment in Washington, D.C.

Frank George — Oil and Gas Industry

Mr. George recently joined the Canadian Association of Petroleum Producers (CAPP) on a secondment from Shell Canada Ltd. He is leading CAPP's involvement with the Sour Gas Safety Review and coordinating CAPP's activities concerning gas plant grandfathering and flaring reduction implementation.

Mr. George has a broad range of experience with Shell, including North Sea and Sarnia refining operations, but his focus during his 24-year career has been on sour gas development and operations in Alberta and northeastern British Columbia. He has a B.A.Sc. in mechanical engineering (University of British Columbia) and an M.B.A. (University of Calgary).

John Squarek — Oil and Gas Industry

Mr. Squarek is the President and CEO of Oasis Energy Inc. He has over 30 years of national and international experience in the oil and gas business, including several years in sour gas exploration and production. Mr. Squarek is a director of the Small Explorers and Producers Association of Canada (SEPAC) and of the Clean Air Strategic Alliance (CASA). Through CASA he has been involved with benzene reduction, solution gas flaring, acidifying emissions, and animal health project teams.

Mr. Squarek has a B.Sc. in petroleum engineering (University of Oklahoma) and a Master's degree in business administration (Adelaide University, Australia).

Robert F. Clark — Land Development Industry

Mr. Clark has worked in the land development industry for 23 years as a builder, an engineering consultant, and a land developer. In 1981 he began employment with Costain Limited, a land development and housing company, with responsibility for several projects in the Calgary and Edmonton areas. In 1989 he joined Carma Developers Ltd. and has worked on the development of several projects in the Calgary area, notably McKenzie Lake, Mountain Park, and McKenzie Towne. He is currently responsible for the development of Carma's communities in north Calgary.

Mr. Clark maintains professional memberships in the Association of Professional Engineers, Geologists, and Geophysicists of Alberta, the Urban Land Institute, the Engineering Institute of Canada, the Canadian Society for Civil Engineering, the Congress of New Urbanism, and the National Town Builders Association. He is a former Chairman of the Calgary Chapter of the Urban Development Institute and is a Past President of the Urban Development Institute of Alberta. A native Calgarian, Mr. Clark holds a degree in Civil Engineering from the University of Calgary and a diploma from the Banff School of Advanced Management.

Robert Ollerenshaw — Land and Development Industry

Mr. Ollerenshaw oversees his family's farming and ranching operations and land development ventures and operates an architectural design firm. Currently he is involved in a residential development project in partnership with Hopewell Residential Communities to develop their joint land holdings in southeast Calgary.

Mr. Ollerenshaw's understanding of the sour gas industry has been gained by participating at many EUB hearings and inquiries related to the development of sour gas facilities in southeast Calgary. This experience has broadened his understanding of the sour gas industry and the impact it may have on public safety, environmental concerns, and the interests of surface owners. His farming and ranching background, combined with land development experience, allows him to provide a unique contribution to the Advisory Committee from both landowner and developer perspectives. Mr. Ollerenshaw also has a Masters degree in environmental design (architecture), from the Faculty of Environmental Design, University of Calgary.

Kevin McLeod — Alberta Health and Wellness

Mr. McLeod has worked with Alberta Health and Wellness for the past ten years. He is currently a Senior Strategy Lead in the Population Health Strategies Branch in the area of environmental health. Previous to this, Mr. McLeod was a public health inspector for a rural health authority and Director of the Environmental Health program for 15 years.

Mr. McLeod is actively involved in a number of key national and provincial environmental health initiatives, including food safety, bottled water and packaged ice, air quality, and climate change. He also teaches a course in Population Health, Promotion and Education at the Concordia University College.

David Spink — Alberta Environment

An environmental engineer, Mr. Spink has over 25 years' experience in municipal, federal, and provincial pollution control and environmental protection. His areas of expertise are environmental regulatory systems, environmental standards, and pollution control technologies. He has spent most of his career working in the environmental regulatory field and has experience in both the development and implementation of regulatory programs. For five years he was the director responsible for issuing the Alberta Environmental Protection and Enhancement Act approvals for industrial and municipal facilities in the province.

Mr. Spink has a strong interest in the public health protection aspects of pollution control and for several years chaired the federal-provincial committee responsible for the Guidelines for Canadian Drinking Water Quality. He has a B.Sc. and an M.Sc. in engineering from the University of Alberta.

Maureen Bolen — Alberta Agriculture, Food and Rural Development

Ms. Bolen has worked with Alberta Agriculture, Food and Rural Development for 25 years in various positions and locations across the province. Presently, she works with agriculture organizations and groups in the areas of leadership, organization, and rural development. She assists agriculture leaders in planning, needs assessments, strategic and market planning, and evaluation. Acting in a facilitation role, Ms. Bolen helps teams and groups work more effectively together to achieve their goals and the goals of the agriculture industry. She has experience in program development, human resource management, and public consultation.

Ms. Bolen has considerable knowledge of the agriculture industry and the "human" side of farming. In the past she assisted farm families with farm accounting, as well as succession and ownership planning. She has a B.Sc.degree.

Cindy Miller Reade — Alberta Municipal Affairs, Local Government Services

Ms. Miller Reade started with Municipal Affairs in 1999 as a Planning Advisor. Currently she provides land-use planning advice and explains planning and land-use based legislation and its applications to individuals, municipal officials, and administrative staff. She also works in conjunction with other provincial ministries on initiatives related to land use. Ms. Miller Reade's interest in alternative dispute resolution is also of value with the Intermunicipal Dispute Resolution Initiative.

Prior to joining Municipal Affairs, Ms. Miller Reade worked with various municipalities (Morinville, Edmonton, Parkland County, and the former South Peace Regional Planning Commission) in various levels of responsibility as a planner. She has written municipal development plans, land-use bylaws, and amendments to these documents and has prepared and audited grant proposals, reports, and discussion and position papers relating to land use and legislation. She has a B.A. (psychology and geography) from the University of Guelph and a B.A.A. (urban and regional planning) from Ryerson Polytechnical Institute.

Ron Wolsey — Alberta Municipal Affairs, Disaster Services

Mr. Wolsey is currently the Executive Director of Alberta Disaster Services, the provincial authority responsible for developing and coordinating the province's emergency plans. The organization also assists municipalities in developing, updating, and exercising their municipal emergency plans and administers delivery of Alberta's Disaster Recovery Programs.

Prior to joining the Alberta government, Mr. Wolsey spent 25 years with the Royal Canadian Mounted Police (RCMP). He was stationed in Saskatchewan, British Columbia, Ontario, New Brunswick, and Alberta. He retired from the RCMP in 1982 to accept a newly created position with the provincial government. As Executive Director of the province's dangerous goods control program, he designed and implemented an initiative that promotes public safety on Alberta's highways through the safer handling and packaging of dangerous goods being transported and through an improved response capability by emergency responders if an accident should occur. Mr. Wolsey has a Management Certificate in business administration from the University of New Brunswick.

Dan Clarke — Alberta Human Resources and Employment

Mr. Clarke is currently the Manager, Legislation, Policy and Technical Support Services for Alberta Human Resources and Employment. He is an occupational hygienist with comprehensive experience in conducting field surveys in air quality, noise, and other workplace health and safety hazards. He holds a Certified Industrial Hygienist designation from the American Board of Industrial Hygiene and a Registered Occupational Hygienist designation from the Canadian Registration Board of Occupational Hygienists.

For the past four years, Mr. Clarke has been manager of a multidisciplinary team of professionals who provide technical and policy support in the following areas: mine safety, radiation safety, occupational health nursing, occupational medicine, occupational hygiene, and safety engineering. Most of his work in the last ten years has involved the establishment and implementation of a regulatory framework for occupational health and safety in Alberta. Mr. Clarke holds a Master of Health Science (occupational hygiene) from the University of Toronto and an Honours B.Sc. (chemistry) from the University of Waterloo.

Brent Friesen — Regional Health Authorities

Dr. Friesen is the Executive Director of the Quality Care and Health Information Directorate for the Calgary Regional Health Authority. Dr. Friesen oversees several areas, including quality improvement, health systems analysis, and health information.

Dr. Friesen completed his specialty training in community medicine at the University of Manitoba. He has an appointment as Clinical Assistant Professor in Community Medicine with

the Department of Community Health Sciences at the University of Calgary. He holds fellowships in community medicine and preventive medicine. Prior to joining Calgary Health Services (subsequently the Calgary Regional Health Authority), Dr. Friesen was Regional Medical Officer of Health for Southwestern Manitoba.

Timothy Lambert — Regional Health Authorities

Dr. Lambert is employed at the Calgary Regional Health Authority as a Risk Assessment Specialist. His sour gas related duties include evaluating risk assessments and emergency response plans for sour gas developments. He represents the regional health authority in EUB hearings. In the last year, he has begun working with other regional health authorities in evaluating sour gas developments.

Dr. Lambert received his Ph.D. in public health science from the University of Alberta in 1998. His research area was ethics and public health practice and communication. Prior to attending university, he worked for two years in the oil patch on a seismic drill. He also served for three years with the Canadian Armed Forces, where he worked with the field engineers and trained in emergency response.

Bart Guyon — Alberta Association of Municipal Districts and Counties

Mr. Guyon is a farmer/rancher in the Drayton Valley area, where he owns and operates a 3000-acre diversified ranch, concentrating largely on bison, elk, and deer ranching. Since November 1997, he has served as Vice President of the Alberta Association of Municipal Districts & Counties. Through the AAMD&C, he also represents rural Alberta municipalities on a number of provincial committees and advisory boards, including Alberta Environment's Pipelines Task Force, the Electric Utilities Advisory Committee, and the Joint Property Tax Council.

Mr. Guyon was first elected as Councilor in the Municipal District of Brazeau in October 1992 and was re-elected in 1995. From 1996 through 1998 he served as Reeve of the Municipal District and Chairman of the provincial Reeve's Association. His background also includes professional certification as an electrician and as an instrumentation mechanic.

Barry Virtue — Alberta Urban Municipalities Association

As Mayor of the Summer Village of Birchcliff, Mr. Virtue represents the over fifty Alberta Summer Villages on the Alberta Urban Municipalities Association's (AUMA) Board of Directors and is the AUMA representative to the Public Safety and Sour Gas Advisory Committee.

Mr. Virtue is a graduate of the University of Manitoba and is a retired Professional Geophysicist. Prior to retirement, he spent over 40 years with industry and government in Alberta, with the latter part of his career emphasizing environmental and socioeconomic issues related to oil and gas industry development. Experience in these areas included work in the Yukon, the Northwest Territories, Nunuvut, East Coast Offshore, British Columbia offshore, Saskatchewan, and Alberta. He has had considerable experience addressing regulatory issues in the environmental and socioeconomic areas at the territorial, provincial, and federal levels. He has served on several provincial and federal advisory committees and task forces related to these matters.

Steve Hrudey — University Risk Research

Dr. Hrudey is Professor of Environmental Health Sciences in the Department of Public Health Sciences, University of Alberta, where he specializes in research and teaching about environmental health risks. He is the author of more than 100 technical papers and reports on environmental issues and has co-authored the books *Risk of Death in Canada – What We Know and How We Know It* and *Bioavailability in Environmental Risk Assessment*. Dr. Hrudey currently supervises graduate student research on environmental decision-making, risk communication, and exposure assessment of environmental contaminants.

David Wilson — University Risk Research

Dr. Wilson has been a Professor in the Mechanical Engineering Department at the University of Alberta since 1971. His research on pipeline rupture release rates and dispersion of toxic gases is now part of land-use and emergency planning models in Canada and the United States. He is the author of a book on concentration fluctuations in plumes and more than 100 technical papers and reports. Dr. Wilson currently teaches both undergraduate and graduate courses in fluid mechanics, engineering design, environmental engineering, and measurement systems.

Doreen Healy — Aboriginal Relations

Born and raised on the Blood Reserve in southern Alberta, Ms. Healy is a Blood Band member. She is currently an independent consultant working in the energy sector on aboriginal, First Nation, and Metis assignments. Prior to this she worked with Amoco Canada for seven years in a number of roles including Native Advisor for the gas and oil business units, Stakeholder Relations Advisor, Communications Advisor, Cultural Training Facilitator, Business Development Advisor, and Policy Implementation Advisor. She was involved with aboriginal policy development, aboriginal negotiations, and the annual strategic planning process.

Prior to her employment in the energy sector, Ms. Healy worked with Indian and Northern Affairs Canada for 15 years as a social worker, a training facilitator, a land transaction officer, an occupational training manager, and as Superintendent of Economic Development, Southern Alberta. She has worked as a consultant for Treaty 7 and she started the Native Economic Developers Association, which today is the Treaty 7 Tribal Council. Ms. Healy has organized major tourism projects, trade shows, conferences, and workshops. She has also worked with the Community Futures Program and organized fund-raising gala dinners for a number of organizations.

Marjorie Young — City of Calgary Administration

Marjorie G. Young is the Manager of the Land Use Planning Division, Planning and Transportation Policy Business Unit, City of Calgary. This group is responsible for land use policy for growth and development in the city.

APPENDIX B

ADVISORY COMMITTEE ON PUBLIC SAFETY AND SOUR GAS
TERMS OF REFERENCE

PURPOSE OF THE COMMITTEE

Through public consultation and analysis, the multi-stakeholder Committee will evaluate existing sour gas policies, standards and regulations, report its findings, and give recommendations to the EUB for implementation by it and others.

VISION OF THE COMMITTEE

- *The regulatory framework for sour gas development ensures a high level of Public Health and Safety*, worthy of continuous public confidence.*

*Public Health and Safety as used in these terms of reference includes immediate or long-term effects of short-term exposure to sour gas on human health. It does not include possible long term or chronic effects of very low concentrations of sour gas on human health. The latter is being dealt with through other initiatives.

DESIRED OUTCOMES OF THE COMMITTEE

- Issues relating to sour gas development are prioritized and suggested actions developed.
- Committee members, the public and the EUB are more informed, knowledgeable and confident about sour gas Public Health and Safety issues.
- Revised requirements to allow for better resolution of current and future sour gas related issues.
- An understanding of how the recommended changes to requirements will affect the rights of all stakeholders.
- Clarification of the roles and responsibilities of the EUB and other authorities such as municipalities and regional health authorities.
- Recommendations that may effect changes or modifications to current technical and non-technical requirements, such as: revisions to emergency planning zone determination methodology; revisions to setback requirements; adoption of standards for hazard and risk assessment; revisions to emergency response preparedness requirements; revisions to public involvement expectations and research needs.

OPERATING PRINCIPLES

- Public Health and Safety are primary considerations in the decision making and reporting of the Committee.
- There is a range of legitimate rights amongst the various stakeholders.
- Public concerns respecting the safety of sour gas development will be addressed.
- Public participates openly in the decision-making process.
- Committee work is open. transparent and relevant.
- The Committee will endeavour to support its recommendations with scientifically based research.
- We trust and respect each other's opinions.
- We are accountable for our actions.
- Our information will be complete and factual.
- Technical information will be presented in an understandable manner.
- The focus of our recommendations is on prevention and continuous improvement.

SCOPE OF COMMITTEE WORK

- The scope of work will centre on a review and assessment of Public Health and Safety related requirements currently being applied to the approval, development and operation of facilities respecting Alberta's sour natural gas resources.
- Although the Committee has been requested not to formally address and make recommendations on chronic human and animal health related to the long term exposure to low levels of sour gas, sulphur recovery guidelines, flaring requirements or compensation matters related to a sour gas release, it is understood that these issues will undoubtedly be discussed in the context of their relevance to the mandate of the Committee.

GOALS AND STRATEGIES

1 To understand the processes utilized and review the findings of the 1994 Advisory Committee to the ERCB on Public Safety and Sour Gas committee.

Strategies: Understand the processes used by the 1994 committee to complete its work. Learn from that committees' experiences what worked and what didn't and use that information in designing suitable processes for this committee. Identify which recommendations were accepted by the Board and the actions taken as a result, and which recommendations were not accepted and why.

2 To review and evaluate current regulatory and non-regulatory requirements and practices for new and existing sour gas facilities. Inventory and learn about other relevant initiatives currently underway or proposed for topics such as alternative dispute resolution, EUB Guide 56 (facility applications guide) review, flaring, animal and human health.

Strategies: Assess all policy and requirements, having regard for the work carried out by the 1994 committee and identify changes since 1994 (technology, research, public concern, etc). Consider critical areas such as sheltering versus evacuation, and long-term health effects of short-term exposure to sour gas.

3 To identify educational needs of the Advisory Committee and arrange for EUB staff, Committee members or outside experts as deemed appropriate by the Committee to provide information.

Strategies: Review needs of the Committee, ask experts to do educational presentations/tours, provide a relevant reading list of papers, and provide current applicable research results.

4 To develop effective processes for receiving meaningful input from constituencies and the public regarding current EUB policies and procedures.

Strategies: Provide a variety of means for input so that stakeholder participation is not restricted. Identify key areas of the Province where sour gas development has been a concern and any community advisory committees that could be invited to provide input. Review and evaluate the information received and incorporate into the Committee's findings.

5 To develop a communication strategy to inform interested parties of the progress of the Committee.

Strategies: Development of a website as well as other communication tools.

6 To identify and prioritize issues based on information and views gathered and develop a report and set of recommendations for the EUB to consider.

Strategies: Develop an understanding of the impact of sour gas development on the public – present and future. Review and evaluate information received.

DELIVERABLES

The Advisory Committee will develop a comprehensive report for submission to the EUB by October 31, 2000. The report will include a description of the process the committee followed, the committee's findings and recommendations. It will also include a proposal for implementing the recommendations and incorporating a continuous improvement process.

ORGANIZATION AND OPERATION

- In consultation with the EUB, the Advisory Committee will retain the services of independent consultants or experts to assist with any tasks the committee identifies as necessary. Funding will be provided by the EUB.

- The Advisory Committee may modify its Terms of Reference to meet unexpected needs without extending the schedule.

- The Advisory Committee should rely heavily on the experiences and expertise of its members and the constituencies they represent. The Committee should also seek broad input from the public to validate and supplement the Committee's views and findings.

- Members are expected to brief their constituencies and obtain both formal and informal feedback on issues and findings of the Advisory Committee.

- When contacted, Advisory Committee members may provide comments to the media expressing their individual views while avoiding stating opinions of other members. To ensure clarity and consistency, media interviews and formal releases of information should be via the Chairman and the Secretariat.

- EUB staff will act as Secretariat to the Advisory Committee and will ensure that any requirements of the Committee are met.

- Meetings will be chaired by an independent Chairman. The Chairman will actively participate in the work of the committee. In the event that the Chairman is not available to chair a meeting, the Committee may select one of its members to chair that meeting.

- Minutes will be kept in the order of the actual agenda of each meeting. The minutes will provide a summary of every matter discussed at each scheduled meeting. Draft minutes will be provided to members for review and comment one week prior to finalizing.

ADMINISTRATIVE MATTERS

Membership

Each Advisory Committee member has one seat at the table, however advisors may accompany the member as appropriate. If a member is unable to attend, an alternate may be designated to attend on that members behalf. The Committee may decide to expand some meetings to include a broader representation of stakeholders, however this will be agreed to by members in advance.

Decisions

The Advisory Committee will make decisions on a consensus basis (no votes) and all dissenting views will be recorded in the minutes and reports as appropriate in the circumstances. There will be no prior restrictions on the issues that might be discussed by the Committee as long as the matters are relevant to the mandate given by the Board to the Committee.

Expenses

The EUB will pay reasonable out of pocket expenses for public members to cover travel and subsistence for committee meetings and public outreach programs. The Board would expect that expenses of other members would be met by their respective organizations. however this may be discussed with the Secretariat on an individual basis as necessary.

Meeting Times and Location

Meeting dates will be scheduled at times suitable to the committee members and well in advance whenever possible. Meetings will generally be held during the day at the offices of the EUB. at a frequency agreeable to the members. Other meeting locations would be at the discretion of the Chair in consultation with the Committee.

ADVISORY COMMITTEE MEMBERSHIP

Members	Constituency Represented
Gerry DeSorcy	Chairman
Marilyn Craig	Secretariat
Doreen Healy	Aboriginal Community
Paul Jackson	Public-at-large
Brian Winter	Public-at-large
Judith Bugg	Public-at-large
Randy Gossen	Oil and Gas Industry
Frank George	Oil and Gas Industry
John Squarek	Oil and Gas Industry
Bob Clark	Land Development Industry
Robert Ollerenshaw	Land Development Industry
Kevin McLeod	Alberta Health and Wellness
David Spink	Alberta Environment
Maureen Bolen	Alberta Agriculture, Food and Rural Development
Cindy Miller Reade	Alberta Municipal Affairs, Local Government Services
Ron Wolsey	Alberta Municipal Affairs, Disaster Services
Dan Clarke	Alberta Human Resources and Employment
Brent Friesen	Regional Health Authorities
Bart Guyon	Alberta Association of Municipal Districts and Counties
Barry Virtue	Alberta Urban Municipalities Association
Marjorie Young	City of Calgary Administration
Steve Hrudey	University Risk Research
David Wilson	University Risk Research
Regulatory Observers	
Arden Berg	Alberta Energy and Utilities Board
Rob McManus	B.C. Oil and Gas Commission
Regulatory Support	
Harry Lillo	EUB, Technical Services Branch
David DeGagne	EUB, Technical Services Branch
Don Beamer	EUB, Technical Services Branch
Greg Gilbertson	EUB, Corporate Support Branch, Communications
Danielle Brezina	EUB, Law Branch
Cliff Supernault	EUB, Technical Services Branch

APPENDIX C

CONCERNS AND ISSUES
PUBLIC OUTREACH SESSIONS

BACKGROUND

A large number of concerns and issues were raised during the public outreach sessions. Others came through Committee members on behalf of their constituents or by way of completed response forms, written submissions, telephone calls, or emails.

This appendix summarizes all of the input received by the Committee. Many of the concerns raised by any one individual were often similar to concerns raised by other individuals. To make the list more manageable, the Committee has combined all similar concerns or comments. It has distinguished between those issues raised by large or small numbers of outreach participants with the following terminology.

> **"Most"** or **"the majority" means about** three-quarters **or** more of those participating in the out-reach program.
> "**Many**" means from about **one-half to three-quarters** of those who participated.
> "**Several**" or "**A significant number**" means from **about one-quarter** to **one-half** of the outreach participants.
> "**Some**" means from about **five people to one-quarter** of the outreach participants.
> "**A few**" means **five people or less**.

"It should be noted, however, that during the public outreach some individuals stated that they represented a number of constituents. Although the Committee doesn't question the validity of these assertions, there is no way of confirming the numbers of people being represented. Consequently, they are considered as a single individual's comments in the appendix."

To make the extensive number of issues raised more understandable the Committee has structured them into the following categories:

- Prevention, Policy, and Jurisdiction
- Event Consequence Management
- Communication and Compensation

There is a section for First Nations and Metis issues collected during that specific consultation program. Although a significant number of issues raised by Aboriginal leaders and representatives are similar in scope to those noted in the above referenced areas, the Committee wanted to keep them in a group to facilitate addressing them in the "Directions" section of its final report.

Numerous other concerns and issues were raised which are not within the direct mandate of the Committee. They are also included in this summary in the following categories.

- Related to sour gas and safety but within areas specifically excluded from the Committee mandate because they are being addressed by other initiatives.
- Not related to sour gas and safety.

I PREVENTION, POLICY, AND JURISDICTION

This category includes the regulations, policies, procedures and processes of the industry, the EUB and other involved jurisdictions, that are used to prevent releases of sour gas and resulting impacts on public health and safety.

A PREVENTION

The effectiveness, efficiency, quality and timeliness of the EUB's system for regulating sour gas operations, including the adequacy of surveillance, and the availability of sufficient numbers of trained and experienced personnel and other resources.

The majority of those who participated in the process raised concerns and questions regarding the sour gas regulatory system. They are particularly concerned with the manner in which the regulations are enforced, although a number also commented on the contents of the regulations. Essentially all of the enforcement comments related to the EUB's field operations.

1 Enforcement

Most of the outreach participants were critical of the EUB's enforcement system but a few endorsed it. They expressed concerns that there were not enough inspections and audits and too great a reliance on self-regulation. Some referred specifically to the need for more and better trained and qualified EUB field staff and pointed to the amount of revenue the government receives from oil and gas resources as a source of the necessary funds.

Some expressed a lack of trust in the EUB and questioned its independence, suggesting EUB staff act like "corporate servants" or "industry team players" working to reduce the liability of the industry. One stated that it was too late for the EUB to catch up, and a few suggested the need for a new outside party to regulate the industry.

2 Public Complaints

One common concern is the degree of reliance on complaints from the public as the basis of enforcement. This was likened to a "band aid" approach where things are done only when the public smells sour gas and complains. The general view is that the EUB should be more proactive and less reactive.

Comments were mixed in terms of the EUB's response to complaints. Many of those who commented considered responses to be slow, but some indicated satisfaction in this respect. One said the EUB field office is too far away. Another said it is better to phone 911 than the EUB. One outreach participant, from industry, indicated that due to privacy rules, the EUB often withholds the name of a complainant, thus making it more difficult to locate the problem.

A few suggested that the EUB, or some other independent body, is needed to mediate and settle disputes, rather than have them end up in court. They added that the onus should be more on the operator to show it is not responsible for the problem, rather than the landowner to prove the operator is responsible.

3 Consequences of Violations

An underlying theme to the concerns regarding enforcement appears to be the lack of severe penalties for those who breach the regulations. Some said there should be zero tolerance where health and safety is concerned and suggested heavier fines and suspension of permits are needed as sanctions. A few indicated that the enforcement ladder approach provides too many second chances and that the EUB is soft on big operators. On the other hand, some pointed to the need for special enforcement for small or new operators. Others said there is a lack of consistency in enforcement.

An interesting comment from some outreach participants, including industry representatives, was that more enforcement is needed to provide a level playing field for industry. It was suggested that adherence to the massive body of sour gas regulation represents a "penalty" to the good operators because lack of enforcement allows the poor operators to largely ignore them.

4 Clarity of Regulations

Input from the First Nations and Metis makes it clear that they have very little understanding of the regulatory role of the EUB regarding sour gas. Some were aware of the EUB, but few knew what its role was and how to contact it when sour gas problems occur.

A few pointed to the need to clarify regulations for the field workers and the public to make them more understandable. They suggested the regulations are so complex that some of the EUB staff don't understand them.

Specific areas of regulation that some of the outreach participants commented on included sour pipelines, particularly old ones, and standing non-producing or abandoned sour gas wells. There is considerable concern that such sour gas pipelines are not inspected and tested often enough, and that undetected pinhole leaks exist.

There is also concern that the old standing wells were drilled many years ago when requirements were less stringent. It was suggested that they require regular inspection to safeguard against leaks, as do old abandoned sour gas wells which may be leaking.

5 Specific Enforcement Issues

The following other specific questions or concerns were raised by one or a few outreach participants respecting surveillance and the enforcement of the regulations: (NOTE: These issues are the opinion of individuals interviewed in the outreach program and do not necessarily reflect the conclusions of the Committee).

- *The frequency and content of the current audit programs conducted by the EUB are not adequate and despite this, there is a backlog.*
- *All new sour gas facilities should be inspected, not simply spot-checked.*
- *Operators should not be informed ahead of time of inspections or audits.*
- *Some operators perform well at first but then become lax.*
- *The EUB should prepare enforcement report cards on each operator and make them public.*
- *The EUB needs to keep a better database on incidents for different sour gas levels and make the data public.*
- *Not only should there be more inspections, but the results should be made known to nearby landowners.*
- *The EUB should inspect sites and facilities to ensure that promises made by industry are kept.*
- *The EUB lacks authority to do its job.*
- *The EUB should be accountable to the people not the industry, even though it provides 80 percent of the money to the EUB.*
- *Level 1 sour gas facilities are not treated seriously enough.*
- *There should be a single complaint number to phone.*
- *One individual had not heard of the EUB.*

6 Regulatory Requirements

A number of outreach participants raised concerns regarding not only enforcement, but also the content of the sour gas regulations. Most such concerns were general in nature and expressed along the lines that there is a need for more and stronger regulations which would guarantee the safety of the public. A few said the regulations were reasonable, but needed updating. One said the regulations are adequate and if they were enforced, public confidence would grow. Some outreach participants said more; understandable information is needed regarding the regulations. They are difficult to understand and not user friendly.

One specific area that some outreach participants addressed related to converting sweet pipelines to sour service and placing old standing sour wells on production. No specific regulatory changes were suggested, other than that these regulations should be made more stringent. There appears to be a belief among some that it is easier to convert a sweet line to sour, or place an old sour well on production than it is to get approval for a new sour pipeline or a drilling licence. This is interpreted as meaning the regulations are not as stringent.

7 Specific Regulatory Issues

The following specific suggestions or comments and concerns were from one or a few outreach participants regarding sour gas regulations: (NOTE: These issues are the opinion of individuals interviewed in the outreach program and do not necessarily reflect the conclusions of the Committee.)

- *More pipeline regulations are needed.*
- *There is a need for detailed test requirements for different fluids and H_2S levels.*
- *The focus should be on preventing long-term health effects.*
- *The EUB should be on site during the drilling of the sour zone at level 4 wells.*
- *There is a need for more stringent emission standards.*
- *Conservation regulations are needed to keep oil and gas in the ground for future use.*
- *There should be protocols rather than guidelines or regulations.*
- *Only one sour gas zone should be open at one time.*
- *Emission thresholds need to be lowered.*
- *There is a need for regulations related to the transfer of ownership of sour gas facilities and notification of such transfers to the public in the area.*
- *A 'Performance Bond System' should be implemented whereby companies collectively contribute money into a bank-managed fund that is accessible for reconciliation of problems related to sour gas.*

8 Specific Regulatory Framework Issues

There were also a number of questions raised regarding the overall EUB regulatory system for sour gas. They included:

- *Does the EUB regulatory framework encourage hazard prevention and continuous improvement?*
- *Are all the components of a good system included in the EUB framework and are they all properly addressed using the best available technology and practice?*
- *How does the EUB regulatory system compare with that used in other jurisdictions?*
- *What is the EUB doing well and where should care be taken not to reduce this service?*

9 Air Quality Monitoring

One aspect of the regulatory system which was raised by some outreach participants was air quality monitoring. Since about 25 outreach participants commented on it, the subject is being dealt with separately.

The most common view expressed was that there is insufficient monitoring being done and the results are not readily available to the public. Some said that there is not monitoring of a sufficient number of pollutants, and that monitors are not sensitive enough to measure low levels which represent a threat to health. Others said that monitors are placed in the wrong locations where less than maximum exposure might be expected, and that monitoring is not done during

the most critical operational and atmospheric periods. A few suggested that the responsibility for monitoring should be with "unbiased scientists".

There was considerable support for monitoring on an airshed basis and a view that this would be economically efficient and would minimize a number of deficiencies of the "piece-meal" approach. A few requested more base line monitoring before new facilities are approved and operating in any particular region.

B APPLICATION AND DECISION MAKING

The effectiveness, efficiency, quality and timeliness of the sour gas application system of the EUB, the degree to which its decisions are sound and reflective of the proper issues and balances, and the effectiveness of communicating EUB decisions and reasons to the stakeholders.

Many outreach participants commented on the EUB's application system. They were generally critical, primarily because they consider the system skewed in favor of industry. Reference was made to the relatively low number of applications that are denied. Statements were made such as the EUB rubber stamps applications, the EUB ignores the public and its technical studies and views, and that a proposal should not be a sure thing. One person said that EUB staff had stated that an approval would be issued even if objections were made. Another said that if an application is in accordance with the regulations there is little point in objecting. Some pointed to the 80 percent funding of the EUB by industry as creating a conflict of interest for the EUB. Others said the drive of government, of which the EUB is part, towards more land sales and royalty income creates a conflict of interest.

Some commented that the EUB puts economics ahead of public safety and lives and therefore is not carrying out its application mandate of serving the public interest. Others questioned how the EUB balances the interests of an applicant against those of landowners in determining the public interest. One suggested that a cost-benefit analysis should be used for this purpose.

Some outreach participants suggested that the EUB should not approve applications of those operators who have poor safety records, violate regulations or do not carry out effective consultation with the public. A few added that smaller companies may lack financial resources to deal with sour gas emergencies and that this should be considered by the EUB in making decisions on applications.

1 Area Development Plans

Many of those who commented on the application process questioned why applications are accepted from one company for a single well when it is known or expected that many more will follow, usually from more than one company. They generally stated that applications should deal with all expected wells, pipelines and plants for a particular area, in essence an area development plan. As a minimum, the public should be given a general description of the total development that can be expected. These concerns relate, in part, to the cumulative health and other effects of all existing and anticipated facilities and it was suggested those effects should be relevant in

dealing with a facility application. A few said the industry and EUB insist there are not cumulative health effects.

2 Routine Applications

Some suggested the EUB should be more proactive in its review and assessment of sour gas applications. The general view is that unless landowners or the public object, the EUB treats an application as routine, whether or not it is complete and acceptable. This is seen as an abrogation of its responsibility, which puts too much weight on the public to study applications, learn new technical subjects and hire experts to do the job the EUB is intended to do. Some outreach participants took the position that sour gas wells or facility application in populated areas should never be treated as "routine" by the EUB.

3 Public Hearings

Some of the outreach participants commented on the hearing process. A few were positive about it and indicated that it was the only time tough questions were answered. Most who commented, however, found the process difficult. Words used to describe it included legalistic, unfriendly, combative, intimidating, and overwhelming to the public.

The need for earlier notification of hearings and more time to prepare was cited by some as necessary changes. A few pointed to the difficulty of hiring experts who are not already working for industry. One person stated that his first notification of a new well was when the drilling rig showed up. Also, some indicated that there should be greater onus on the applicant to prove that no negative health effects will occur rather than on the intervener to prove that they will.

4 EUB Role as Facilitator/Mediator

Some suggested that the EUB should be more involved in negotiations to resolve concerns respecting applications, perhaps even acting as a mediator. They suggest such negotiations need to be better structured so that decisions are made and recorded. It was also suggested that the EUB needs to take a more active role in ensuring that promises made in negotiations or at hearings are kept.

5 Level of EUB Resources

In addition to the concerns raised regarding the numbers of EUB field staff, there were also concerns about whether the EUB has sufficient resources, including an appropriate number of experienced staff, to do its job related to applications. One specific question was whether the EUB has sufficient decision-making capability and expertise to deal with public health issues such as toxicity and technically complex matters such as risk assessment. There were also suggestions that the use of performance bonds be increased as part of the application process.

6 Specific Application Issues

The following is a summary of additional concerns or questions respecting the application process which were raised by a few outreach participants or an individual: (NOTE: These issues are the opinion of individuals interviewed in the outreach program and do not necessarily reflect the conclusions of the Committee).

- *There should be an appeal process of EUB decisions.*
- *If an application is in accord with the regulations it is approved even if 100 percent of the public in the area oppose it. This is unfair.*
- *Applicants are sometimes untruthful about their geological target, receive a licence for a sweet gas well without opposition, and then change it to a sour well when it is too late to oppose it.*
- *There should be mandatory involvement of Alberta Environment and Regional Health Authorities at EUB hearings.*
- *More baseline studies are needed before applications are approved.*
- *There should be mandatory involvement by Regional Health Authorities in the review of applications.*
- *Does the EUB take into account any Planning Approvals that may be established for lands affected by setbacks and Emergency Planning Zone's prior to granting an application to develop a sour gas facility?*
- *First Nations and Metis settlements should be properly notified and involved in relevant applications.*
- *Regulatory hearings should focus on project specific issues rather than being used to address broad public issues.*
- *EUB decisions are not always consistent with earlier decisions or from area to area in the province.*
- *EUB decisions should give adequate recognition to negative impacts on urban growth, the tax base, the need for existing or future infrastructure, existing development approvals, and restrictions to development on private lands.*
- *Are there situations where, due to an uncoordinated process, third parties have been able to bring the approval process to a costly halt?*

C INDUSTRY PERSONNEL, EQUIPMENT, AND PROCEDURES

The adequacy of equipment and procedures used by the industry to prevent the release of sour gas, and the availability of adequate numbers of properly trained personnel.

1 Role of Industry

Many outreach participants in the public outreach program raised concerns and questions respecting the industry's role in the prevention of sour gas releases. A few said they trust industry.

The most frequently mentioned issue related to the adequacy of personnel. Some of the outreach participants raised concerns at the number of young, inexperienced workers who, due to the hectic pace in industry, are working on sour gas drilling rigs or other facilities. A few recounted incidence where family members or friends are working in situations they are not trained for and have experienced close calls.

A few said the industry had to be more stringent in the hiring of contractors and not simply take the lowest bid. There was some criticism that land agents are simply looking to get signatures as fast as possible at the lowest cost. Promises they make are often not kept.

2 Worker Training

Particular concerns were raised respecting the sour gas training and experience of those working for new and smaller companies. Also, there was mention of the need for a certification of all sour gas workers.

3 Worker Reliability

Concerns were also raised by a few that sour gas workers may be tired because shifts are too long, or that use of alcohol or drugs might reduce workers ability, thus increasing the chance of an accident. One said workers are pressured by management to cut corners, but blamed if something goes wrong.

Some individuals suggested that there are many sour gas accidents in industry that are not reported because of arbitrary rules, someone told them that a worker needs to spend two days in hospital before an accident is reported. They commented that this is done to make the record appear better than it is. The need for an independent investigation of every sour gas accident was put forward by a few outreach participants.

4 Pipeline Integrity

Some of the outreach participants raised concerns respecting sour gas pipelines, particularly those that have been in service for many years. There is much concern that corrosion is causing small pinhole leaks which are a threat to public safety, but which cannot be detected by current test procedures. They pointed to the need for more and better testing. A few suggested the all sour gas pipelines of a certain age should have to be re-applied for and their continued use justified.

5 Best Available Technology

The concept of industry using the best equipment and procedures available, rather than the minimum required, was put forward by some outreach participants. They generally said that where sour gas is concerned, maximum safety standards should apply regardless of the cost. One issue noted by a few outreach participants was the frequency of small leaks at valves or elsewhere. There was also a suggestion that all sour gas equipment be tested and qualified for use by independent experts. On a somewhat different note, there was a suggestion that claims that certain equipment is inadequate are being used to squeeze out small service companies.

The role of the industry in air quality monitoring was mentioned by some outreach participants. As indicated in the Regulation section of this report, the general view is that more air quality monitoring is needed and the results need to be made more public. There was a suggestion that all sour gas workers should carry personal monitors.

6 Specific Issues Related to Role of Industry

The following additional concerns or questions were raised by one or a few individuals regarding the role of industry in preventing sour gas releases: (NOTE: These issues are the opinion of individuals interviewed in the outreach program and do not necessarily reflect the conclusions of the Committee.)

- *Greater emphasis should be put on prevention of sour gas releases rather than mitigation of the potential effects of a release.*
- *Proper procedures must be used during sour gas drilling operations.*
- *There should be more directional drilling to minimize conflicts between surface facilities and the public.*
- *Abandonments must be properly done to ensure against future sour gas leaks*
- *Tubulars and other equipment being used for sour service must be suitable and there must be sufficient quality checks.*
- *What are the advantages and disadvantages of pipeline corridors?*
- *Surveillance and monitoring activities must be sufficient to ensure facilities are appropriately maintained and operated. For example, they must be adequate to ensure against non-functioning safety valves (including well-head, subsurface and pipeline).*
- *Is there sufficient understanding and recognition of changes in H_2S content that may take place over time; for example: is there disruption of the reservoir by pressure increases due to injection for enhanced recovery, or migration of gas from deeper sour zones into shallow sweet formations?*
- *When complaints are made to operators they sometimes ask that the EUB not be called.*
- *We should not trust technology and computers.*
- *Sour gas warning signs are not adequate.*
- *There are too many emissions and too much venting of sour gas.*
- *Glycol dehydrators should not be allowed.*
- *All sour gas producers should have to join CASA.*
- *Industry does not know where sour gas is migrating to underground.*
- *Industry has not improved and its standards are not based on scientific research.*

D POLICY

The effectiveness, efficiency and reasonableness of the policies of the EUB and government respecting sour gas and public health and safety.

1 Restrictions to Sour Gas Development

About 30 outreach participants raised concerns respecting the policy of allowing sour gas development near population centres or in rural areas with relatively dense population. Only a few suggested that sour gas production should be totally discontinued, but most who commented on this matter believe further controls are needed. Some expressed a view that sour gas development should be halted until technology improves to the point where there are no risks to public safety.

Some suggested there should be areas, for example near cities or recreational centres, where sour gas development is not allowed. Others said sour gas facilities in such areas should be limited, and that special regulations should apply. Other suggestions were that sour gas operations in such areas be allowed only at certain times, that population density be a criterion of approval, and where there are many problems between surface owners and sour gas developers, applications should be refused.

2 Mineral Leasing

There were a number of comments respecting the leasing system. Some suggested the need for the government to be more restrictive in leasing and to institute controls prior to leasing. Suggestions included that the public and EUB be involved before lands are leased, and that only certified sour gas producers be allowed to purchase sour gas resources. A few commented on the need for a planning process that would allow maximum recovery of resources while minimizing impacts on surface developments. Others noted the need to inform potential purchasers of sour gas resources and land or residences in sour gas areas, of the existence of sour gas related concerns and problems.

A few suggested revamping the leasing system to reflect "need not greed", and a greater pursuit of alternative energy.

3 Impacts vs Benefits

A few asked questions such as how potential negative impacts of development on the public in a region are reconciled with benefits that may flow primarily to industry, the provincial government and the broad public. Another question related to how the Board balances various interests in determining the "public good", including the relative benefits of developing the surface rather than the subsurface minerals and the expectation of the right to develop by surface and sub-surface owners.

Questions were also asked as to whether the owner of the subsurface resources has the right to develop its holdings in preference to the owner of the surface lands, and what options are available to mitigate the potential conflicts between resource and urban development.

4 Proliferation of Sour Gas Facilities

Another area commented on by some of the outreach participants was the proliferation of numerous sour gas wells, pipelines and processing plants in any particular area. There is a general view that only the minimum amount of facilities necessary to recover the resource should be allowed, and that ownership by different companies should not be a reason for duplication. A few suggested a need to develop and enforce a non-proliferation policy, including forced unitization if necessary. Most of those who commented on this matter are of the general view that the fewer facilities, the fewer conflicts, and lesser cumulative effects.

5 Specific Policy Related Issues

A number of other questions were raised which, although related to other challenge areas, are policy matters for the EUB.

- *Should companies be subject to enforcement action for deficiencies in public consultation or should the emphasis be placed on education? Should professional organizations (APEGGA, Landman's Association) take disciplinary action for deficiencies or should the emphasis be placed on education?*
- *Is there a need to develop technical training/certification programs for field operations staff with the aim of raising the technical expertise required? The Oil and Gas industry has established training and experience requirements for plant operators but little or no training requirements (outside safety training) for Field Operators.*
- *Do setbacks apply to suspended non-producing wells?*
- *Are Emergency Response Plans updated and tested often enough and are all parties kept up to date?*
- *What can land within setbacks be used for?*
- *Are there any restrictions on development of land within the emergency planning zone?*

E JURISDICTION

The legal jurisdiction of the EUB respecting sour gas and public health and safety and the effectiveness and efficiency of its relationship with other levels of government or government departments also having some related jurisdiction.

1 Overlapping Jurisdictions

Some of the outreach participants raised jurisdictional issues. Most of those who commented stated a concern that there was a lack of clarity of responsibility between different departments and agencies about jurisdiction. This results in confusion, the appearance of conflicts, and a "passing of the buck" when complaints are made. All of this is frustrating to the public. Particular reference was made to the shared responsibilities of the EUB and Alberta Environment, to confusion as to who is responsible for emergency response planning, and to the lack of involvement of Regional Health Authorities, and to the lack of accountability because of the involvement of so many parties.

Suggestions for improvement include better coordination, clear guidelines respecting responsibilities, an understandable description or chart readily available to the public, and that the EUB take the lead role in all sour gas matters.

Some suggested that there needs to be early involvement of local authorities, particularly those involved with health, in the planning, hearing and decision process and in emergencies. They commented that there needs to be a better relationship established between Regional Health Authorities and the EUB with respect to applications and other sour gas matters, and that the health authorities should have the lead role on health issues. One suggested the Health Authorities not the EUB, should handle applications as well as emergency response planning. Others said municipalities or Regional Health Authorities should be able to prohibit sour gas development in certain areas. A few questioned the exemption of some industry facilities from the Municipal Government Act.

Questions were raised as to whether or not the EUB has jurisdiction respecting the property rights of first nations or Metis settlements.

2 Specific Jurisdictional Issues

A number of other questions or concerns were raised by a few outreach participants regarding jurisdiction.

- *What is the role for the use of land use by-laws or orders under the Public Health Act or other legislation to control development in proximity to sour gas developments to minimize the population being placed at risk?*
- *Is it possible to have a single window approach to regulation and yet have consideration for all aspects including those of overlapping jurisdictions, and is the current "single window approach" actually working?*
- *Is there a need for clarity on which agency establishes the Emergency Planning Zone and setbacks as well as other jurisdictional matters?*
- *Where changes to the regulatory system are contemplated, how can they be implemented for all municipalities, recognizing that there are various amounts of technical expertise available to different municipalities?*
- *At what point are the EUB, disaster services and health authorities notified of releases and uncontrolled releases?*

II EVENT CONSEQUENCE MANAGEMENT

This category includes the procedures and processes used to manage the public health and safety consequences that result from releases of sour gas.

A EMERGENCY RESPONSE PLANS

The effectiveness of emergency response plans, including appropriate coordination with other relevant plans and agencies, and the availability of resources to implement the plans in all situations.

A significant number of respondents commented on the topic of emergency response planning and preparedness. The areas most frequently addressed included communication with residents about emergency response planning, notification in the event of an emergency, responses of industry and government to an emergency, and the quality of the plans.

1 Stakeholder Involvement

A significant number of the respondents mentioned communication with residents regarding emergency response plans. The comments mainly addressed the quality of resident information packages, consultation about emergency response plans, and the accessibility of plans and emergency information. Others expressed a concern about inadequate notification by companies.

A few outreach participants indicated that there should be better communication and coordination between the EUB, the companies, the municipalities and the public when developing emergency response plans. Some individuals stated that fire departments and disaster services in the municipalities are not involved enough in emergency response plans and that there should be more cooperation between fire and disaster services, the municipalities and companies.

In order to ensure that the plan reflects the nature of the area and the community, it was suggested that there be a community coordinator who works with the company to develop the plan and then assists in communicating it to the community.

2 Testing the Plan

It was suggested by outreach participants that emergency response 'practice runs', organized by the companies would be beneficial and that the public should receive earlier notification of events. A few of the outreach participants were concerned that the emergency response plans are not fool proof and question their reliability since they are never tested before an incident occurs. Another individual indicated that some companies conduct mock exercises and that these have been beneficial.

Some suggested that the EUB should increase their monitoring of emergency response plans because the public lacks overall confidence in their effectiveness.

3 Emergency Response Plan Deficiencies

Most of the outreach participants had concerns regarding the emergency response plans. Some of the concerns were that the emergency response plans do not consider livestock, animals in general, topography, or climate. A few identified concerns about the effectiveness of the emergency response plans because they do not detail evacuation of children from schools, and because of an inability to notify and evacuate individuals working in the fields, recreational users and large numbers of and urban population. Other issues ranged from the absence of phones in some areas to the inability for evacuation because of dead end roads to poor response (answering machines, no answer) of emergency response phone numbers. Some individuals expressed concern about the hospital's ability to handle several knock down victims at one time.

Some outreach participants believed there was inadequate notification of the public in the event of a problem. Yet few outreach participants believe that the existing approach to providing the public with information about emergency response plan serves to increase resident's anxiety.

Another indicated that their experience working with industry on their area emergency response plan has been positive, and one case resulted in a monitor that is connected to a siren tower instead of constructing a road.

4 Size of Emergency Planning Zone

Several outreach participants stated that the emergency planning zones need to be larger to include people near the border of the zone, to account for wind, and to be based on property line not residence, so that a landowner who uses land for grazing is notified and can in turn notify those who have grazing leases.

A few respondents raised specific concerns about the reduction in size of an emergency planning zone in populated areas in that if it was not feasible to increase the size of an emergency planning zone then the project should not be allowed to proceed. A few outreach participants also said that the measurements used to determine emergency response zones are inadequate. Some outreach participants were insistent that the EUB not reduce emergency planning zones to 4 kilometers from some larger calculated distance. One individual suggested that an emergency response zone reduction places too much pressure on the municipality.

Some respondents indicated that establishment of emergency planning zones should be site-specific, not by formula. These respondents thought that factors such as topography, land use issues, wind direction, and specific community or individual issues should be considered.

5 Specific Emergency Response Planning Items

The following specific suggestions or comments and concerns were from one or a few outreach participants regarding emergency response planning: (NOTE: These issues are the opinion of individuals interviewed in the outreach program and do not necessarily reflect the conclusions of the Committee.)

- *There should be more training for volunteer police and fire, and more education and information for company employees and members of the public about emergency response planning and preparedness.*
- *Emergency planning zones should be based on protecting 99% of the population against neurological damage, not on kilometers. The numbers are arbitrary and the awareness zone is inadequately selected. EPZs should be based on reasonable medical expectation; death is not an acceptable limit.*
- *Packages should be more comprehensive and include a feedback form. If the company were unable to resolve the issues identified on the form, they would go to a review board and then a hearing.*
- *Resident information packages should include isopleth information for SO_2 and H_2S.*
- *Resident information packages should be completed prior to making an application.*
- *How would a resident know if they were sensitive to sour gas? What tests could they take?*

- *Uncertain about who keeps the personal resident information.*
- *Use sirens and or speakers. (e.g., a monitor connected to a siren that alarms at 10 parts per million).*
- *Need electronic monitors in homes located near a sour gas well.*
- *Need to include notification of an emergency to those whose residences who are not in the emergency response zone but who own land that is within the setback or EPZ zone (individual was outside and was "gassed" during an incident).*
- *Should be informed of emergency evacuation before level two is reached.*
- *Sheltering problems – can't use the furnace since it uses outside air.*
- *Success of igniting a well would depend on factors such as time it would take to call Calgary.*
- *There is no egress route, would have to pass the well, or over the pipelines. (two comments).*
- *Locals should be hired to advise about evacuations and awareness procedures, as they know the area.*
- *Employees who would be involved in evacuations should be bonded and carry formal identification.*
- *Industry should have a properly trained emergency response tact team, funded in part from royalties. They should be mobile and supplied with necessary resources.*
- *Emergency Response Plans should be filed with the Municipal District Disaster Response Team.*
- *Establish minimum acceptable performance (i.e., blocking roads and evacuation) and minimum performance expectations (i.e., reliability of phone-out service, number of people available per road, number of required air quality devices).*
- *Consider if the resources match the plan, if proposed evacuation and road blocking procedures are feasible.*
- *Need to have an Emergency Response Coordinator from the community to ensure the plan is operable.*
- *Need more enforcement to ensure plan is implemented and there is follow-up.*
- *Need a province-wide Emergency Response Plan.*
- *Companies should pay for resident to leave their homes during drilling.*

B LIMITATIONS IN THE QUANTITATIVE KNOWLEDGE OF HEALTH EFFECTS, DISPERSION, AND RISK ASSESSMENT

The understanding and confidence of the public with the scientific basis for decision making to ensure that public safety is not compromised as a result of normal industry operations or in the event of a major incident.

A significant number of outreach participants stated that they lack any detailed understanding of the tools used to calculate risk to the public from a sour gas development or what the actual health impacts might be should they be exposed to some form of sour gas emissions. As a result there is little confidence in the EUB or industry to provide adequate public safety.

1 Air and Water Quality

Some raised public health concerns with specific reference to air quality, noting that emissions cause acid rain and damage galvanized barbed wire. A few individuals indicated that testing of environmental quality (air and water) should be more extensive, specifically in environmentally sensitive areas, and that the approach used for testing should be consistent throughout the province.

A few of the session outreach participants had concerns about the lack of monitoring of benzene, a known carcinogenic, and suggested that the health authority should be more involved and advocate for health issues related to sour gas.

2 Cumulative Effects

Some outreach participants suggested that the EUB must take into account the cumulative affects of the air quality caused by sour gas wells and then make policies that keep people safe. They indicated that more research was required in the areas of: cumulative effects and the effects of sulfur dioxide. Outreach participants believe that these are having a negative impact on the air and water quality and that a variety of the human and animal health issues in the area (respiratory problems, insomnia, reproductive problems, nausea, etc.) are related to these environmental issues.

Most of the outreach participants suggested that, given the cumulative effects, there should be drilling limits established near populated areas and that all wells (level I, II and III) need to be scrutinized closely - not just level IV wells. It was suggested that several level I wells could be just as hazardous as one level IV given the cumulative effects and the lack of monitoring.

Some of the individuals participating expressed concern over the cumulative effects of sour gas activity and the relationship to negative human, animal and environmental health. It was suggested that there should be more research into cumulative effects.

The suggestion for risk to be assessed on a cumulative basis was made by a few outreach participants. They indicated that new wells should not be drilled until the actual risks of existing wells are understood.

3 Health Effects and Toxicity (Human and Animal)

Several of the outreach participants mentioned health risks that they believe are caused by sour gas emissions. They mentioned health concerns including: cancer, asthma, respiratory problems, brain damage, livestock problems, allergies and emotional stress, and added that the latter is detrimental to their mental well-being. There was a general feeling that these issues are ignored by companies and EUB, especially in the decision making process.

Several indicated that they (and their neighbors) have experienced negative health impacts ranging from: breathing problems, sore throats, nausea, feeling intoxicated, nose bleeds, headaches, strokes, heart attacks, and cancers. It was suggested that not enough consideration had been given to the potential effects of long term, low-level exposure to emissions. In addition, outreach participants indicated that there are negative mental health consequences related to sour gas activity resulting from stress, anxiety and frustration.

A few outreach participants emphasized that the existing standards for acceptable levels are arbitrary and do not reflect individuals with chemical sensitivities. In addition, a few individuals indicated the stress and worry associated with sour gas issues has been detrimental to their mental health.

A few outreach participants mentioned the rising rate of asthma among children in the area as a concern and expressed a desire for the link between sour gas emissions and human health to be explored further. The lack of technical information about the health risks (human, animal and community) associated with sour gas was cited as a problem. One individual indicated that because of the lack of understanding about the health impacts of sour gas emissions, medical professionals were not addressing potentially related health issues adequately.

A few outreach participants indicated that medical professional in Alberta do not recognize health issues resulting from sour gas emission and as such, the public does not receive appropriate treatment and it is not covered by Alberta Health.

4 Future Research

Some of the outreach participants indicated that there has not been enough research conducted related to the negative environmental impacts (air and water quality) of sour gas emissions and the relationship to human and animal health. Outreach participants are tired of all the 'talk' about research and believe that companies and the EUB are not acknowledging the link between sour gas and health. In addition, outreach participants suggested that the results of research are not accessible to the public.

Several individuals indicated that there should be more research into the long-term health effects related to sour gas emissions. Further, some of the outreach participants suggested that there needs to be more research related to the environmental impacts of sour gas emissions (air and water quality, relationship to topography) and that alternatives to flaring need to be explored.

The need for research related to the chronic health effects of long-term exposure to sour gas emissions was identified by several outreach participants. The lack of baseline data related to long-term effects was mentioned.

5 Risk Assessment

Some of the outreach participants mentioned that residents are taking all of the risks and that they have nothing to bring to the bargaining table. They further indicated that operators have control of the situation because they do have something to bargain with and often times they underestimate the level of risk to the community.

Some individuals stated that the notion of long-term research in the context of risk assessments is artificial because the issue has not been researched over the long term. Some suggested that there has not been sufficient risk and hazard assessment related to flaring and the potential for forest fires. Others indicated that risk and hazard assessment is not valid because it does not include long-term health effects. Still others suggested that risk assessment should be localized and provide for site-specific circumstances.

6 Specific Suggestions

The following other specific questions or concerns were raised by one or a few outreach participants respecting health effects, dispersion and risk assessment: (NOTE: These issues are the opinion of individuals interviewed in the outreach program and do not necessarily reflect the conclusions of the Committee.)

- *The government does not take health considerations into effect as much as they should when making policy because of the royalties they receive.*
- *The EUB does not acknowledge the connection between poor health and sour gas.*
- *Because the government earns so much money from oil and gas, health risks and concerns are not adequately considered in making decisions and policy.*
- *The EUB and oil companies do not appear to have the same concerns as the general public that is exposed to the emissions.*
- *Evacuation criteria are all right for those in that occupation but are unacceptable for the general public.*
- *Mandatory evacuation levels may be too low. In general, the public cannot tolerate the same levels as workers.*
- *The public is forced to be exposed to carcinogens - it is like having to be around second hand smoke.*
- *The industry is not looking at the effects of atmospheric pollution on animals and especially the potential extinction of the Grizzly bear.*
- *Cattle in the area have severe selenium and magnesium deficiencies due to increased sour gas levels.*
- *Doesn't believe that the EUB utilizes doctors that understand all aspects of chemical exposure. There are no doctors in Alberta who can recognize chemical poisoning and we are very behind the U.S. in this respect. The medical community usually blacklists the few doctors who do have knowledge of chemical poisoning and treat it.*
- *The guidelines set by the EUB that determine the suitable levels of chemicals are dangerous because it reduces the liability for the industry. You can't win a lawsuit because the company can be found responsible BUT not liable if they are within regulations.*
- *The EUB takes an engineering approach to health. They take a look at the highest H_2S exposure that someone can survive and they use that as a measure for acceptability. This is unacceptable.*
- *Do not believe that paying farmers to store carbon in the soil so that companies can continue flaring is a good policy.*
- *EUB monitors H_2S and SO_2 but who monitors carcinogens such as benzene?*
- *Doesn't believe that the government recognizes the value of an individual when setting policy to protect public health and safety. i.e., easy to ignore the safety of a single farmer, harder to*

ignore the safety of a community.

- *Respondent is concerned about people who have different genetics i.e., women marrying into the community, whose bodies may not be able to fight off the toxins as effectively.*
- *Wells shouldn't be put in populated areas because rural communities and their lifestyle are being ruined.*
- *Old sour gas plants should be tested for health compromises.*
- *The EUB needs to scrutinize more Level I, II, and III wells. There should be detailed and regular checks on every well, not just random checks or checks in response to complaints. Having many Level I's in an area could be more hazardous than having one Level IV in an area since the Level I isn't as closely monitored.*
- *Reduce emissions to the lowest possible level, rather than settling for 'safe levels' and spending huge amounts of money to determine what safe levels are. People respond to 'safe levels'. There must be recognition that people have and develop chemical sensitivities.*
- *The EUB should have guidelines to check wells and equipment more often in sensitive areas.*
- *The public doesn't understand occupational health and safety standards. The current levels are unacceptable, at 30 PPM the public should be informed. People with sensitivities should be informed at early levels. Identify and make a registry of people in the area (with sensitivities marked out).*
- *Need new criteria and zoning according to population, topography, recreational usage, wind direction, amount of wells. There should be a limit on the concentration of gas wells in certain areas (especially populated areas)*
- *No more development should be allowed because the safety of the community is being sacrificed.*
- *Need stronger regulations on pollutants. This should consider all chemicals including trace amounts.*
- *Preventative public health should prevail over reactive health.*

C SETBACKS

The reasonableness of the setbacks used by the EUB and the role of setbacks in decisions by the EUB and other jurisdictions.

In general outreach participants in the public outreach view setbacks as inadequate, and at times unfair, where a landowner has land impacted by a setback from a facility on another landowners property and receives no direct financial benefit as a result. There is also the perception that a rural resident is considered to have less value than urban based on the setback criteria.

1 Setback Criteria

Some of the outreach participants suggested that setbacks are currently not adequate and need to be more site specific and consider topography, settlement patterns, wind and climate as well as matters such as company performance, risk and hazard assessment, and consequences of an incident. Several suggested that long range urban development plans be used when determining setback distances.

Several of the outreach participants indicated that the setbacks are too small. Suggestions ranged from 2 km to 20 km. Others stated that the existing approach to establishing setback distances is arbitrary.

A few outreach participants suggested that the zones be based on property lines instead of residences. Others suggested that setback related issues are not a matter of inadequate distances. but instead are a result of lack of maintenance of sour gas facilities.

A few outreach participants felt that the setbacks were appropriate but were concerned that increased setbacks would result in even greater land sterilization than currently exists.

2 Specific Suggestions

The following other specific questions or concerns were raised by one or a few outreach participants respecting setbacks: (NOTE: These issues are the opinion of individuals interviewed in the outreach program and do not necessarily reflect the conclusions of the Committee.)

- *Need to use more measurement and technology to establish setbacks.*
- *Consider property not just residences.*
- *All setbacks should be at the same distance instead of based on the number of people in the area.*
- *Not clear why the setbacks are different for campsites and residences.*
- *Setbacks "sterilize" the area (a few comments)*
- *Setbacks for Level 4 wells need to be larger.*
- *Municipalities can build right up to a pipeline but not individuals*
- *When someone wants to make a facility 'public' they have to make sure there are no wells within a 1.5 km radius. It should be that a well could only be put in when there is no 'residence' within a 1.5 km radius as well.*
- *Setbacks should apply to every residence.*
- *Setbacks need to be simple.*
- *There are health concerns relating to existing setbacks.*
- *Set a long-term quota for each area instead of using setbacks.*
- *One well per section is too many*
- *Need a zoning system that establishes acceptable and unacceptable areas for exploration and development.*
- *Need a no-drill buffer zone around major urban areas (from municipal boundary). This should be based on projected city growth over at least 20 years*
- *Setbacks have implications for land values*
- *Need to know the level of existing and potential wells as this determines setbacks.*

III COMMUNICATIONS AND COMPENSATION

This category examined the process of communication between EUB, industry and the public, and compensation matters related to sour gas development

A PUBLIC CONSULTATION

The effectiveness of communications respecting sour gas development between the EUB, industry and the public.

Most outreach participants felt that communications between the public, industry and the EUB needed vast improvement.

1 EUB Related Issues

A few individuals indicated that two-way communications with the EUB is not satisfactory and that the EUB is sometimes vague and unresponsive. It was suggested that this has diminished trust in the EUB.

Some of the outreach participants stated that the EUB hearing process was ineffective and is too expensive and time consuming for the public. A few people were frustrated because despite the fact that even though there are several groups opposing a project, the EUB and the companies are always considered to be correct. "If there are that many people with concerns, can they all be wrong?"

A few of the outreach participants noted that the existing communication, hearing and regulation approach requires the public to prove that there is a problem rather the industry proving that there isn't a problem.

2 Industry Related Issues

Most of the outreach participants indicated that the companies were difficult and frustrating to deal with and arrogance and intimidation from the companies was not uncommon. This has lead to a generalized distrust of the industry and in some cases apathy within the community - people become frustrated and give up. Many outreach participants stated that industry's (especially landmen) poor communication with the public was a consistent problem. It was stated that a number of companies do not keep promises and in some cases are disrespectful. In addition, it was stated that the flow of information between the industry and the public is limited and slow.

A few of the outreach participants mentioned challenges related to communication between the public and some of the energy companies. These individuals indicated that some of the companies in the area take advantage of people, "put them off", and do not respond to their concerns adequately. It was suggested that communications could be improved if there was a better flow of information. A few of the outreach participants suggested that the companies were somewhat communicative during the development process, but that on-going and follow-up communication is poor.

One outreach participant stated that some companies in the area are making an attempt to make the initial contact with the public more positive and to maintain communication throughout the process. Another said that communication with industry has improved significantly over the past few years.

3 Collaborative Processes

Some individuals had favorable comments about the response and conduct of companies and the EUB. It was suggested that the presence of industry/public/government collaborative processes such as the Sundre Petroleum Operators' Group (SPOG) has improved relations.

A few individuals suggested that the Regional Health Authority (RHA) and municipalities could be more involved and become sources of information.

4 Trust and Credibility

Many people have the perception that the companies and the EUB have a good 'PR front' but do not take the public's concerns seriously. As such, there is a high level of distrust and a loss of credibility. Some of the outreach participants suggested that because communication with the companies and the EUB has been so difficult and unrewarding that many members of the community do not bother to file their complaints and concerns anymore.

A few of the outreach participants believe that they have no one to turn to who will actually listen and help them. Because of their experiences, they distrust the EUB and view them and the operators as not credible.

5 General Observations

Most of the outreach participants indicated that public consultation is necessary and essential. However, it was suggested that the consultation process should take place before money is exchanged for mineral rights so the company knows what the individual/community expects and the individual/community knows what the company intends to do.

Some industry and public outreach participants indicated that the difficulties between the oil companies and the public are company specific and that some companies are 'communications driven' and respond effectively to the public. Some oil companies attempt to provide the community with information, hold open houses, and generally build trust within the operating area.

Although a few outreach participants spoke well of the public consultation process, some thought that there is a lack of information sharing and that the information gathered is quickly forgotten. There needs to be better coordination between the EUB, companies, the government and the public, and improved response time to issues and effectiveness of any action. It was suggested that an ombudsman or public advocate would be the most effective approach to solving the problem.

Some of the outreach participants said that the public is not clear on the role and jurisdiction of the EUB. oil companies and Alberta Environment and that there is confusion about who to call with concerns.

A few view the process as a series of broken promises that generally ignores the community issues until the residents become angry. A few suggested that all industry answers be written and signed.

A few suggested that a standard for public consultation between the public and companies needs to be established and enforced. One individual suggested that consultation with First Nations and Metis needs to be improved and suggested better translators. In addition. the outreach participant suggested that there needs to be a better understanding of the EUB's jurisdiction in First Nations and Metis communities.

A few outreach participants believe that research should be made more accessible to the public.

A few outreach participants relayed positive experiences with companies and indicated that they are satisfied with the level of communication. One individual stated that the public generalizes a single negative industry experience to all companies.

6 Specific Public Consultation Suggestions

The following other specific questions or concerns were raised by one or a few outreach participants respecting public consultation. (NOTE: These issues are the opinion of individuals interviewed in the outreach program and do not necessarily reflect the conclusions of the Committee.)

- *There should be a type of "checklist" the EUB can make available to landowners who are approached by companies.*
- *It is a good idea to have one person at the company that looks at public concerns so that the public is always informed.*
- *The EUB should give any information for free.*
- *Applications should be advertised in the local newspapers (not just the main centers of Alberta) and ads placed in the post office.*
- *Maintain communication with public by company operations group after well is developed.*
- *Respondent would like to see the industry present at community events such as fairs, trade shows, and the mall - be staffed with properly educated and versed employees available to answer questions.*
- *Would like to be able to discuss matters with industry members on more of a one-on-one basis.*
- *Promises should be in writing.*
- *Specialists are needed to explain "how and why" to the public.*
- *People want to know safety records.*
- *The EUB should have a website with a map of all sweet and sour gas locations.*
- *New and upcoming well locations should not be kept confidential.*

- *Public should be informed of any testing done, or chemicals being used. If the companies let the public know about results it would ease the public's fear and also protect the industry from needless accusations and rumors.*
- *Seismic people should advise when they are coming.*
- *Land men must be educated so that they can address concerns, also be respectful and polite. They should know about the negative and positives of oil and gas on agriculture and the communities. There is a need to know the following: Is it sour? Will it flare? What's the drilling time? Traffic concerns and water well concerns?*
- *Provide notification of proposed drills and up-to-date information on status of operations and what they're encountering.*
- *EUB should provide an info package about how to use the EUB, who to contact, what the EUB offers.*
- *Clarify the EUB's jurisdiction on First Nations and Metis communities' land.*
- *EUB should be instilling the value of conscientious conduct to the companies.*
- *Communicate about problems when they occur.*
- *Industry and the EUB should openly discuss their mistakes.*
- *Open houses should be held on an annual or biannual basis to provide the public with general information and address concerns. This would alleviate a lot of concern.*
- *Industry should provide monthly/annual tours of their plants for interested people.*
- *Public meetings should be mandatory when developing in area and should address the environment, health and public issues.*
- *If a large majority of residents decided against the well/plant then it would not go through. But if a large majority did not have issues, were neutral, or did want it, then it would go through.*
- *Consultations should begin earlier. Decision-making is done too late in the process, when an anchored alternative is in place and the other alternatives cannot occur; this is not a true process. Don't come in at a point when all of the decisions have been made.*
- *When calling the EUB, respondent would like to have clear responses from them rather than just sending them elsewhere.*
- *When a development is proposed, identify a third party - person with technical expertise - who the public can contact. The person must be at arms length from the government and the industry - cannot be the EUB.*
- *Increase the notification zone to a 7 km radius.*
- *Increase the area for those to be contacted concerning emergency response plans to 8 km.*
- *Consultation with the First Nations and Metis communities has to include better translators*
- *If public had some involvement in who bought mineral rights they would ensure that companies had enough money to cover any cleanup or necessary health/safety concerns.*
- *General good will exercises are appreciated. i.e., shrinking leases, fence repair, giving free acres, decreasing setbacks on farmland.*

B PUBLIC KNOWLEDGE AND AWARENESS

The adequacy of the knowledge and understanding by the public of sour gas development and public health and safety.

Most respondents expressed concerns with the current public knowledge about sour gas. Concerns included the difficulty in accessing information, the general lack of public awareness, the uneven playing field, misinformation, the lack of informed decision-making, and concerns with getting information from the media, industry, the EUB and environmental groups. Further, there is generally poor understanding of safety related requirements such as emergency response plans, emergency planning zones, setbacks, dispersion modeling, and risk assessments.

1 Accessing Information

Most of the outreach participants indicated that there is a need for more awareness regarding sour gas and the potential issues. Information pertaining to sour gas development needs to be readily available to the public and in a form that is fair and accurate. This information should include the results of any research documentation, particularly related to long-term health issues, with appropriate references of where the data can be found.

Suggestions to improve awareness included more open disclosure of information from companies to the public and more company open houses, balanced media involvement, school based education and information events. One outreach participant suggested that companies provide all of their related records to the local public library so that the community could better understand their corporate neighbors.

A few outreach participants indicated that because of misinformation, largely by the media, the public had unfounded fears about sour gas development.

2 Industry Related Issues

A few people said that industry was too large to fight and intimidated the public. A few others said that the public had blind faith in the industry and are not aware of the dangers or issues surrounding sour gas.

3 Consultation and Decision Making

Most of the outreach participants suggested that there is an overall lack of public awareness about the decision-making process, and contact information, and that this needs to be resolved. People should be made aware that they do have the opportunity to provide input into the decision making process. The publics' role in decision-making and the relationship of sour gas to public health were specifically mentioned as topic areas that require enhanced public knowledge and awareness.

A few others indicated that the public does not understand how they can have input into the decision making process.

4 EUB Related Issues

There was a general feeling by some of the outreach participants that there is a lot to learn about sour gas and that the amount, and the technical content, discourages the public from becoming informed. One outreach participant believed that the EUB does not bother to inform residents because it is to their advantage to have an ignorant public.

Some outreach participants indicated that the EUB system was confusing and that more user-friendly information should be developed (e.g., info package). In addition, outreach participants indicated that the EUB response time to concerns was slow.

Most of the outreach participants indicated that the public has a low level of awareness related to sour gas issues and more events and activities should be conducted to improve awareness - public education is essential.

Several said that there needs to be more openness about the environmental effects of sour gas and the results of research. In addition, there was suggestion the EUB needs to provide more information about its role and how the public can access them.

5 Specific Public Knowledge and Awareness Issues

The following other specific questions or concerns were raised by one or a few outreach participants respecting public knowledge and awareness issues: (NOTE: These issues are the opinion of individuals interviewed in the outreach program and do not necessarily reflect the conclusions of the Committee.)

- *Signage - All well sites should have clear signs as to the type and percentage of sourness. There used to be signs which said "poison gas, no stopping", and now there are none.*
- *Community Groups - Respondent feels a good solution would be to give the interested community group's information about operations. (e.g., Sundre Petroleum Operators Group)*
- *Public Libraries - Companies should provide all documents that they use in public consultation to public libraries.*
- *Schools – Go into schools and offer training programs in an attempt to educate - offer open tours of the facilities. Alberta is a petroleum-based province, so education should begin at junior high. i.e., This is what the oil industry is about; these are the issues; these are the jobs. Sundre Petroleum Operators Group contracted a student to make their website (contest) in return the student received a $2000 computer. Also to bring up speakers to talk with children.*
- *Committees - Multi-stakeholder committees to be a positive approach. Communities could develop airshed committees - address all airborne chemicals.*
- *EUB Newsletter - Respondents receives the EUB newsletter and says this is useful information, although they usually hear about new developments in the area from neighbors and friends. Respondents haven't noticed any health article in the EUB newsletter and feel there should be some.*
- *Land Developers - Increase land developers' awareness because with more information then they are given the chance to come up with strategies that could benefit communities/developers and the industry.*

- *Applications - Should have diagrams to explain proposals*
- *Past Hearing Records – Should be available.*
- *Public needs to be educated and understand how sour gas facilities affect human health and distinguish between fact and fear mongering.*
- *The government should be taking care of the problems so that the citizen does not 'have to' spend so much time becoming informed.*
- *The EUB should educate the public more so that they know what questions to ask and then have the ability to make informed decisions.*
- *Industry needs to share details about mistakes so that everyone would be able to take part in learning from accidents and all could work together on improving actions to prevent future incidents.*
- *If people were to know of recent new technological changes it would put people's fear to rest.*
- *The EUB should admit to the air quality issues so that everyone could work together towards a better solution. Awareness brings public good will.*
- *All affected residents should be given the proposed drilling/pipeline information beforehand so that they have a chance to absorb and react to the information.*
- *Important to communicate with landowner from day one.*
- *Need to have an up-to-date and accurate database of all pipelines (old and new) in the region. This needs to be available to the general public for use. i.e. Third party land users*
- *Need more awareness of intervener funding.*
- *People must be aware they do have input into the location of sour gas wells, facilities that are allowed on site and have the option to object to these facilities regardless of whether the facility is on their land or their neighbors land.*
- *It should be made known easily that there are sour gas wells in the area. It should be known that if you can smell the gas, there is something wrong, and where to go, what to do, etc.*
- *The public would be more confident in the industry if they knew that sour gas developers are required to reach a certain level of competency.*
- *Need to hold "H_2S Alive" courses and CPR training for the public.*
- *Have local representatives of the EUB for people to go to. EUB field offices should always keep up to date information. The 'government' should be out there and make themselves consistently seen by the public in order to gain the trust.*
- *Communities could develop airshed committees - address all airborne chemicals.*
- *While the internet is useful to people who will take the time to do the research, the others, who are usually the most fearful and misled, do not have access to the internet.*

C COMPENSATION

The reasonableness of the manner in which the benefits and costs related to sour gas development is shared among Albertans, including financial matters such as compensation to the extent that they impact on public health and safety.

1 Fairness

Some of the outreach participants had issues with compensation, generally suggesting that compensation from companies is inadequate and that the onus is on the public to prove their claims. It was suggested that a framework of equitable compensation be developed and that companies should be required to be more responsible.

A few outreach participants noted that everyone is affected by emissions, yet only the landowner, on whose land the facility is located, is compensated.

2 Industry Responsiveness

Some outreach participants expressed dissatisfaction with compensation, providing a variety of personal accounts where compensation from the companies has been difficult to receive and/or inadequate.

Some of the outreach participants suggested that the companies should be responsible for paying for increased air and water testing and the ongoing monitoring of the environmental effects of sour gas activity. In addition, it was suggested that the companies should be responsible for paying for the recovery time resulting from illness due to sour gas emissions.

Several outreach participants suggested that some of the profits from the industry go toward clean up and that no company should be given a license until it proves that it can handle potential problems and clean up.

One individual suggested that companies cannot compensate everyone and that the system is often abused.

3 Property Values

A few of individuals expressed concerns about diminished property values resulting from sour gas activity. A few suggested that the companies should be required to assume long term financial responsibility for the negative impacts of sour gas activity (e.g., property values, health issues).

One individual suggested that neighbors should be compensated as well as the landowner.

D RISK COMMUNICATION

The effectiveness of the communication with the public about risk related to sour gas development and public health and safety.

1 Risk Related Information

Many of the outreach participants said that the effectiveness of the communication about the risks related to sour gas activity is not good. There is a lack of linkages between the research, health professionals, companies and the public. People should be educated about the risk so they know what to do in an emergency and they know what questions to ask. The information should be more user friendly and not include so many technical terms.

A few outreach participants made positive comments about communications with industry and the EUB. However, it was suggested that the EUB and industry should be more forthcoming about risks.

Some of the outreach participants question whether the EUB has credibility because of its lack of accurate, consistent answers and its inability to consistently regulate the industry.

2 Perceived Risks

Some of the outreach participants indicated that because of inadequate monitoring or enforcement and because the industry and regulators are 'economy driven' operational alternatives are not sought, the community is forced to suffer the consequences (air and water contamination) of flaring.

Some of the outreach participants suggested that the EUB and others do not provide enough information about possible risks and the community is not effectively made aware of existing wells and Emergency Response Plan's - the community is expected to assume the risks.

A few of the outreach participants suggested that the possible effects of 'toxic cocktails' (a mixture of gases) in the context of public health has not been explored.

3 Specific Risk Communication Issues

The following other specific questions or concerns were raised by one or a few outreach participants respecting communications related to risks associated with sour gas development: (NOTE: These issues are the opinion of individuals interviewed in the outreach program and do not necessarily reflect the conclusions of the Committee.)

- *Companies often downplay and dismiss the potential dangers of the sour gas well.*
- *Companies play with numbers (emissions).*
- *We are being lied to about safety.*
- *Questions not answered about safety and health.*
- *Most questions have been well answered. "Fly by night" operators create a bad reputation for big companies.*
- *Some companies are slow to admit there are effects such as air and water contamination, until it is too late.*
- *People are not advised that even within the safe levels for chemicals people with chemical sensitivities may be affected. As well, the mixture of chemicals may be dangerous.*

- *People are not advised about possible risk and the types of materials to which they may be exposed.*
- *Need to communicate anything that will impact the residents, anything out of the ordinary.*
- *Industry and government pretend they don't know all the effects but they do know the problems.*
- *Signs don't say sour gas anymore.*
- *If another Lodgepole happened, Calgary would be gone. The severity of the situation was downplayed.*
- *The EUB and industry have assured individuals that sour gas operations are safer since the Lodgepole blowout but the evidence is not clear.*
- *Public has to find their own information.*
- *Companies operate on "no news is good news". This constricts communication.*
- *More information should be made available to public e.g., difficult to get a copy of the report on the Lodgepole blowout, only parts of the report appear to have been made public.*
- *People need to be aware of danger before entering the area.*
- *New entrants into the community should be advised of existing wells, Emergency Response Plans, possible water contamination.*
- *Need a 1-800 number for residents to phone if they have concerns or issues or particular sensitivities.*
- *Need signs along rivers advising about the existence of pipelines wells, possible water content.*
- *If a well is near the end of a dead end road: signs should be at the head of the road and at the boundary of the lease.*
- *Fundamental information about long term health and safety is missing, so risk cannot be effectively communicated.*
- *Decisions are made on risk assessments that ride only on statistical information of tragedies.*
- *Some studies are not legitimate and compromise the statistics.*
- *EUB says there are not deaths in the industry from sour gas. However, the health system database of exposure is not centralized enough to realize if a death is attributable to sour gas.*
- *Effects of H_2S exposure may not be attributed to certain health problems and may not be recognized by health care practitioners. Need to perform a search of coroners' records.*
- *Risk assessment shouldn't be watered down, have benchmarks for acceptable levels of risk.*
- *Need to establish if gas is coming from the plant.*
- *Should incorporate probability of incidence using actual site data into communication – create a more truthful understanding of the risk.*
- *Knowledgeable, well educated on the issues representatives should be present at public meetings.*
- *Companies should be required to visit residents every two years but they should communicate every time there is an upset or something might affect people.*

IV FIRST NATIONS AND METIS ISSUES

Aboriginal peoples in Alberta have their own very distinct culture and form of government. The Committee met with eleven First Nations and Metis Councils, including Indian Oil & Gas Canada, which generated a series of key and common issues related to sour gas. While many of these issues are similar to those expressed by other citizens of Alberta, Aboriginal peoples are impacted in a slightly different manner as a result of their unique culture and status.

The Committee was able to identify several major areas of concern Aboriginal peoples has respecting sour gas development, these included:

- The need for increased public awareness and information among First Nation and Metis communities related to the issues surrounding sour gas.
- Concern about the effectiveness of Emergency Response Plans (ERP) and their familiarity with them so they are able to ensure the safety of the First Nations and Metis communities.
- Issues about the negative impact of development on traditional lands and sacred sites; and,
- The need for improved communication between the EUB, the companies and First Nations and Metis people.

The following summary has been organized into three topic categories, including (1) Prevention, Policy and Jurisdiction; (2) Event Consequence Management; and, (3) Communication and Compensation. These topic categories correspond with the Advisory Committee's three working groups, which have been established to assess and address specific aspects of the issues surrounding public health and safety and sour gas. The key points from the First Nations and Metis consultations have been summarized within each of the topic categories, as follows:

A PREVENTION, POLICY, AND JURISDICTION

Some of the community representatives suggested that the EUB should increase audits and inspections to ensure that companies are following regulations and that regulations should be enforced more strictly.

EUB regulations should be more 'user friendly' and accessible to the public was noted by a few of the groups.

It was suggested by some that companies and the EUB need to be more involved with First Nation communities.

A few groups indicated that more advanced notice of proposed development is required and that more consideration should be given to traditional lands; hunting areas; traplines and sacred sites.

Several outreach participant groups suggested that there should be more First Nations employment within the local industry and First Nations contractors should be hired for work on Reserves – there is not enough local employment provided by the oil and gas industry.

Activity off or adjacent to Reserves that does not respect traditional areas or sacred sites was identified as an issue by some of the community groups and organizations. Suggestion was made for the creation of an EUB Committee with First Nations representation, possibly elders, funded by Government, to address these kinds of issues.

A few indicated that the regulations should include a structure or process so that First Nations and Metis people can address issues with regulators. Currently, there are too many jurisdictions and the process is convoluted.

A few of the participating groups indicated that there is a perception that governments decisions favor the oil and gas industry because of economic gain.

The application and decision making process not appropriately considering traditional lands was identified as an issue by a few outreach participant groups.

Some indicated that there needs to be a centralized process to inform First Nations and Metis people and involve them in decision making about sour gas.

A few groups stated that jurisdiction needs to be clearer and interaction between the decision-making bodies needs to be improved.

B EVENT CONSEQUENCE MANAGEMENT

There is a general concern among First Nations and Metis groups that participated in the discussion sessions about the health and safety of the community and the protection of the environment – fear in the community about sour gas being deadly.

Some of the communities indicated a variety of health concerns (headaches, kidney disease, respiratory problems, cancer) that may be a result of sour gas activity. One community indicated that health impacts rose following a burst pipeline. There are health concerns on some of the Reserves (asthma, respiratory problems) that are believed to have a direct relationship to sour gas emissions. Stress and anxiety about the possible negative effects of sour gas was cited as an issue in some of the communities.

One of the communities was concerned about the proximity of a flare to a school and the resulting negative health impacts to the children. They indicated that they have seen a rise in asthma and respiratory problems in the community. Another community has experienced effects from the Lodgepole blowout including: increased health problems (asthma, respiratory problems), smell, and environmental effects.

There is concern about leaks and smells associated with sour gas among a few of the communities. Suggest that there should be detectors at various locations on the Reserves. There was a suggestion by a few groups that setback distances should be larger and site specific and should consider prevailing winds.

One of the First Nations group have done some preliminary work on an ERP and have partnered with Fort Saskatchewan and are working with other First Nations.

Changes in company ownership have effected the progress of one of the ERPs.

It was suggested that companies need to provide more information about ERPs and evacuation plans.

There is a general anxiety among some of the communities about the threat of sour gas incidents and concern that ERPs will not effectively protect their people.

A few communities indicated that ERPs are not effectively communicated and there is fear within the community. There needs to be more interaction and participation with and from the community.

One community has received some funding to develop an ERP but it is not enough. There is concern within this community about the effectiveness of an ERP given the uniqueness of the community (contact, evacuation). The community is very discouraged.

The companies have been invited to participate in developing an ERP by one of the communities. but there has been little cooperation.

One community indicated that their ERP has major communications flaws related to notification and evacuation. The community has attempted to develop their own plan that more effectively addresses the needs of the community (marshal stations, evacuation plans. alternative routes).

It was suggested that visible monitors would be effective and would better protect the community and serve to reduce some of the anxiety in the community.

One group suggested that development by oil and gas companies in traditional lands has provided more access (roads) for First Nations people, but has been harmful to the plants and animals.

There is concern about the impact of sour gas development on the health of game animals among a few of the communities.

A few groups suggested that more research is required related to the effects of sour gas on game animals and its impacts on hunting and trapping.

C COMMUNICATION AND COMPENSATION

Most of the First Nations and Metis outreach participants suggested that there is a need to raise public awareness between the companies, the EUB and First Nations communities about the issues related to sour gas. ERPs were noted by a few communities are requiring particular attention in terms of public awareness and education. A few community representatives indicated that companies and the EUB are not effectively communicating with their communities. It was suggested that local First Nations committees are required. One group indicated that communication needs to be improved between the industry, the community and emergency services.

It was suggested by some that community workshops, presented in a format that is appropriate for First Nations/Metis people would be beneficial for raising public awareness. A suggestion was made for First Nations facilitators to conduct community workshops.

Another group indicated that, to raise awareness, educational programs/curriculum within the school are needed.

Some suggested a need for more information resources and more funding for public awareness, particularly from the Federal Government.

The suggestion was made by some that more interaction between the communities, the industry and the EUB is required and that there needs to be more First Nations people within the industry and the EUB – it validates the public participation process.

Issues with regard to companies' response time related to complaints and concerns about the attitude of the companies were presented by some of the groups.

One group indicated that companies put locks on gates and restrict access to hunting and trapping.

A few groups indicated that contractors are not always sensitive to diversity and are arrogant and there have been communication problems and animosity.

One community identified a need for improved cellular communication – a new transmission station.

D ALPHABETICAL LISTING OF FIRST NATIONS AND METIS GROUPS THAT WERE CONSULTED

Alexis First Nations
Aseniwuche Winewak Nation of Canada
Enoch Nation
Horse Lake First Nation
Metis Settlements General Council
Metis Nation of Alberta
O'Cheise First Nation
Sturgeon Lake Cree Nation
Sunchild First Nation
Treaty 8 First Nations of Alberta
Tsuu Tsina First Nation

V SOUR GAS MATTERS BEYOND THE COMMITTEE MANDATE

A number of matters that relate to sour gas and public health and safety were beyond the mandate of the Committee because they recently had been, or currently are being, handled by other stakeholder initiatives.

Notwithstanding these exclusions, outreach participants in the outreach program often raised questions and concerns regarding these matters. They are summarized in the following:

A FLARING

Many outreach participants raised concerns regarding the flaring of sour gas and the resulting potential negative effects on public health and safety. They expressed concerns about the possible long-term health effects of exposure to sour gas. Several participants identified a variety of symptoms that they or friends, relatives and neighbors have experienced that they believe are a result of emission. Examples include: headaches, asthma, nausea, insomnia, miscarriages, and cancer.

All who commented believe there is too much flaring and some contend there is even more flaring during the night when it is less noticeable. Some contended there should be zero flaring because converting the H_2S to SO_2 and distributing it in a diluted form over a large area is not acceptable. Others stated that more incineration, rather than flaring, is needed.

A few suggested that flaring should occur only when atmospheric conditions are ideal, and never when there is an inversion. Others said there must be greater focus on gathering, conservation, and the conversion to alternative energy needs, perhaps by generating electricity or putting the sour gas back into the formation from which it came. A few said better testing technology should be used to reduce the length of tests and related flaring.

Some were aware of the recent CASA flaring initiative. Most were supportive, but question why any new flaring is being allowed and why there isn't greater emphasis on reducing sour gas flaring in populated areas. A few stated that they wanted to have input to the flaring initiative but were never contacted.

Other suggestions for improvement with respect to flaring included the need for government and industry to spend more on developing new technology (such as incineration and filtering), to eliminate the nitrogen before flaring to obtain greater efficiencies, and to set safe boundaries around a flare site.

A few expressed concerns regarding flaring caused by the domino effect of pipeline leaks. Others questioned whether flaring is adequately understood and handled, particularly respecting combustion efficiency, safety, high H_2S volumes, and ignition problems.

They expressed concerns about the possible long-term health effects of exposure to sour gas. Several outreach participants identified a variety of symptoms that they or friends, relatives and neighbors have experienced that they believe are a result of emission. Examples include: headaches, asthma, nausea, insomnia, miscarriages, and cancer.

B LONG TERM EFFECTS OF LONG TERM EXPOSURE

Some outreach participants questioned how the Committee could accomplish any good if it did not concern itself with the long-term effects on health of exposure to low concentrations of H_2S and other sulphur compounds. They were interested in the planned research study "Western Canada Study on Animal and Human Health Effects Associated With Flare Emissions", but most had not heard about it. A few suggested it should have a greater focus on human health, and all who commented said the results should be made public.

C INTERVENOR COSTS

A few commented on intervener costs. It was suggested that applicants and the EUB did not make people aware of the availability of intervener Costs to avoid hearings. Indeed, it was suggested that many from the public don't demand hearings even when they are dissatisfied because they believe they will have to pay the costs.

D SULPHUR RECOVERY

A few outreach participants commented on sulphur recovery at sour gas processing plants and suggested higher recovery requirements are needed. One stated that very stringent air quality standards which must be met would force higher recoveries. Another questioned whether small companies have the financial resources to meet the recovery standards that should be set.

VI MATTERS NOT RELATED TO SOUR GAS

A number of concerns were raised respecting matters that do not relate to the impact of sour gas on public health and safety. They are summarized in the following.

A GROUND WATER PROTECTION

Some outreach participants expressed concerns respecting the impacts of seismic work, particularly on water wells, and suggested all seismic holes should be fully cemented.

Concerns regarding the effects of the oil and gas industry on potable water were raised by some. Suggestions were made that all domestic water wells be tested prior to oil and gas developments, that more surface and other casing be used, that double bonding cement be used, and that injection of water for secondary recovery purposes be terminated. There were also concerns regarding pollution of surface water. Someone indicated the results of water testing were not communicated.

B ABANDONMENT/RECLAMMATION

Other areas mentioned by some were the proper abandonment of wells with full cementing, and the cleanup of abandoned sites. It was suggested that the EUB should be responsible for approving reclamation since it issued approvals.

C MISCELLANEOUS

Other questions or concerns raised by one or a few outreach participants included: (NOTE: These issues are the opinion of individuals interviewed in the outreach program and do not necessarily reflect the conclusions of the Committee.)

- *More sampling and testing of soil.*
- *More secure fencing.*
- *Noise.*
- *No pipelines diagonally across lands.*
- *Lining of sumps.*
- *Oil companies are allowed to clear more land than are the landowners.*
- *More reforestation is needed.*
- *Environmental Impact Assessments on all projects.*
- *Less traffic and related problems.*
- *More focus on each of water, soil and air as separate related systems.*
- *More dikes around facilities.*
- *What happens to vacuum truck residue?*
- *Rules to prevent operators from ruining wells by producing them too hard.*
- *Assurance all equipment meets CSA standards.*
- *Zero tolerance suggested for pollution.*

APPENDIX D

PROVINCIAL ADVISORY COMMITTEE ON SOUR GAS AND PUBLIC SAFETY RANDOM SAMPLE TELEPHONE SURVEY SUMMARY RESULTS

Purpose

The random sample telephone survey is one component of the Committee's public consultation process. Conducted in June 2000, the purpose of the random sample telephone survey is to provide an understanding of the awareness, perceptions, and opinions of Albertans within areas known to have a high density of sour gas activities to the issues surrounding sour gas and public health and safety. The specific objectives of the telephone survey are

- to generate baseline information about the general public's awareness, concerns, and knowledge about sour gas and
- to solicit more detailed information related to perceptions, opinions, and experiences from those who are more aware, exposed, and/or knowledgeable about the issue.

Study Approach

The survey results are representative of two major geographic segments. The first includes rural communities and surrounding areas in proximity to sour gas activity. The second geographic segment includes the urban centres of Edmonton, Calgary, and Red Deer. The urban centres were further stratified to include only the communities in proximity to sour gas activity. The total population within each of these geographic segments is approximately 283,000 for the rural and 525,000 for the urban centres, representing about 27 per cent of Alberta's total population.

Both the rural and the urban samples were drawn randomly from telephone lists matched to postal codes within the target areas. Using a random sample approach allows inferences to be drawn about all the people who live within the areas of study. For values related to the entire population (urban and rural) the error is estimated to be ±- 3 per cent, 19 times out of 20.[1] For example, if the survey revealed 65 per cent of respondents indicating, "yes" to a question, the true value would lie between 62 per cent and 68 per cent, 19 times out of 20.

The rural sample included the areas around Millarville/Vulcan, Pincher Creek, Drayton Valley, Rocky Mountain House/Sundre, Grande Prairie, Edson, Hinton, and Leduc. To ensure adequate representation a stratified sample was used that drew a random sample of approximately 100 people from each rural area and 400 people from Edmonton, Red Deer, and Calgary combined.

The stratified sample was chosen to ensure that all communities were represented in the survey. For example, had we drawn a simple random sample of 1,300 from the combined urban and rural areas, we would have had only a handful of responses from areas like Drayton Valley or Millarville in comparison to Calgary and Edmonton. However, the stratified sample ensures that a minimum sample size for analysis is obtained for each area.

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[1] 19 times out of 20 is the level of confidence, also referred to as a 95% confidence interval. This means that if the sample were repeated 20 times, the values would fall within the range of the true value 19 times. The level of confidence and the margin of error are a function of sample size.

Summary of Results

Overall the results indicate there is a good awareness of sour gas issues in the areas that were sampled. Although there are issues that could be improved, minimal dissatisfaction was evident. For example, most people affected by an emergency response zone felt that the plan provides a sense of safety. However, many also did not believe they are kept up to date on changes to the plan, and most have not had the plan or the response actions explained to them by a facility operator.

Few people surveyed have land affected by a setback; those who do, are relatively content with the setback distances. There was a general feeling by the respondents that they lack information regarding sour gas proposals in their community, preventive measures, activities of local operators, and emergency response actions. The results also indicated that the communication mechanisms among the public, government regulators and companies could be improved, as respondents do not believe them to be adequate or readily accessible. Respondents said that direct mail is the preferred method for delivery of information regarding sour gas issues to local residents.

Although the oil and gas companies are considered to be the best source for sour gas information, there is general dissatisfaction or neutral feeling regarding the local operator's responsiveness to community concerns. This lack of responsiveness is considered to be a factor for all companies. The respondents also believe there is a lack of opportunity for public involvement in sour gas decisions.

People who had been involved in a public consultation process said they are satisfied with the ability of the process to resolve the issues. They also considered the timing of the consultations to be adequate and most believed that the process reduces public anxiety.

Three-quarters of those surveyed had heard of the Alberta Energy and Utilities Board, or EUB, and most identified its role as that of a regulatory board with regard to sour gas and public health and safety. Few people actually had had contact with an EUB employee, but those who did were satisfied with the contact. Just fewer than half of those surveyed said they thought that the regulatory board adequately considers health and public safety when making decisions regarding sour gas issues.

Most of the respondents did not know any of the benefits to themselves and their community from sour gas developments. However, the risks and inconveniences were better understood. Although health concerns were the biggest risk identified, just fewer than half of all participants believe that scientists clearly understand the effects of sour gas on public health. On the whole, about half of the respondents indicated that sour gas facilities were somewhat of a concern to them.

APPENDIX E

SECTION 4 OF DIRECTIONS, A WORK IN PROGRESS, OCTOBER 2000

4 DIRECTIONS

This section indicates the direction the Advisory Committee is moving in with respect to its recommendations for each of the priority issues and sub-issues identified in Section 3. Without actually preparing detailed recommendations until it has heard further from stakeholders, the Advisory Committee has attempted to give sufficient detail so that the reader can appreciate what the general content of the recommendations might be.

4.1 OVERVIEW OF EXISTING SOUR GAS REGULATIONS

As part of its review, the Advisory Committee examined and had numerous presentations of current sour gas regulations being used or applicable in Alberta. It found that while the regulations are extensive and comprehensive, they seem to be very piecemeal, residing in many different statutes and other legislative instruments. This makes it easy for newcomers to the industry or from outsiders looking in to get the perception that Alberta's sour gas regulations are lacking. The Advisory Committee believes that this may be partly a result of the fragmented nature of the requirements. For example, EUB-administered sour gas regulations and requirements can be found in the following documents:

- *Oil and Gas Conservation Act and Regulations*
- *Pipeline Act and Regulations*
- Informational Letter (IL) 85-3: *Operational Use of Flare Guns—Forested Public Lands*
- (IL) 87-8: *Emergency Response Plans for Sour Gas Facilities*
- Interim Directive (ID) 88-2: *Proposed Wells, Production Facilities, and Pipelines Notification of Rural and Urban Administrations*
- IL 88-17: *Ignition Equipment for Drilling Critical Sour Wells*
- IL 89-4: *Public Involvement in the Development of Energy Resources*
- IL 89-15: *Evacuation and Ignition for Sour Wells*
- IL 89-20: *Compensation in Case of Well Blowout*
- ID 90-1: *Completion and Servicing of Sour Wells*
- IL 90-13: *Critical Sour Well Completion and Servicing Operations*
- IL 90-17: *Emergency Procedure Plans for Sour Gas Facilities – Biennial Meetings*
- ID 91-2: *Corporate-Level Emergency Response Plans*
- IL 91-2: *Sour Gas Flaring Requirements and Changes to Regulations*
- ID 94-3: *Underbalanced Drilling*
- IL 95-1: *Government of Alberta Support Plan for the Upstream Petroleum Industry*
- IL 96-10: *A Memorandum of Understanding Between Alberta Environmental Protection and the Alberta Energy and Utilities Board Regarding Coordination of Release Notification Requirements and Subsequent Regulatory Response. Appendix A: Alberta Environmental Protection Release Reporting*
- IL 96-11: *Government of Alberta Emergency Response Support Plan for an Upstream Petroleum Industry Incident*

- ID 97-6: *Sour Well Licensing and Drilling Requirements*
- General Bulletin 99-7: *Hydrogen Sulphide (H_2S) Release Rate Assessment and Audit Forms Guidelines.*

These documents are available from the EUB's Information Services in Calgary (403) 297-8190 or on the EUB's Web site at www.eub.gov.ab.ca .

4.2 DIRECTION STATEMENTS

The following Direction Statements for priority issues are not in any particular order of priority. The introduction to each issue includes a brief overview of the comments and concerns heard throughout the process. A complete summary of the input received during the public outreach process is in Appendix C.

4.2.1 DEVELOPMENT PLANNING

Introduction

Many of the participants in the outreach process expressed concerns regarding the degree to which sour gas facilities exist and are being built in relatively populated areas. Few suggested that sour gas production should not be allowed, but several expressed the view that sour gas production should be halted until technological improvements make it safer. Some suggested that there should be areas, for example near cities or recreational centres, where sour gas development is not allowed or is limited. Others raised general concern that there appears to be little coordinated planning between the development of the surface and the exploration and production of subsurface resources. Some suggested that changes to the sour gas leasing system as it relates to planning should be considered for lands that may produce of sour gas.

Many outreach participants also raised public health and safety concerns respecting the number or density (proliferation) of sour gas facilities in any one area and questioned whether these were necessary to recover the resources. There was a general view that only the minimum amount of facilities necessary to recover the resource should be allowed, regardless of ownership by different companies.

This area has been further divided into the following sub-issues:

- Coordination of surface and subsurface planning and development.
- Subsurface resource planning and development.

Major Driver Issue: The adequacy of coordinated planning at all levels (industry, government, local authorities, Aboriginal people) regarding surface and subsurface development as it relates to sour gas and public health and safety.

Statements of Direction

Coordination of Surface and Subsurface Planning and Development

Increasing concerns regarding sour gas development near and adjacent to communities, including Aboriginal settlements, were expressed by many during the public outreach process. The Advisory Committee believes that the coordination and integration of sour gas resource development planning and municipal planning would help to mitigate potential conflicts between land-use and sour gas development, thereby reducing negative impacts on public health and safety. It is also of the view that changes to the existing mineral leasing system should be considered in an effort to minimize the number of sour gas wells and other related facilities.

The Advisory Committee is therefore moving in the direction of recommendations towards greater coordination of resource and municipal development. This would involve integrative planning among industry, government, and other involved stakeholders, which could include matters such as

- coordination and integration of municipal development plans, area structure plans, land-use bylaws, and other municipally approved plans as they relate to sour gas development;
- delineation and recovery of sour gas reserves in a timely manner;
- increased community awareness of potential sour gas development;
- recognition of impacts of resource development on Aboriginal lands with respect to traditional lands and sacred sites;
- changes to the mineral (oil and gas) leasing system to minimize sour gas wells and other related facilities; and
- modification of the existing Crown Mineral Disposition Review Advisory Committee to address the possible impacts of sour gas development on public health and safety.

Subsurface Resource Planning and Development

The Advisory Committee believes that efforts should be made to improve the coordination of subsurface planning of sour gas resources with the aim of minimizing proliferation of the number of sour gas facilities. The direction of the recommendations will be towards those measures or initiatives that would assist in minimizing the number of new facilities. These would include

- support for the recommendation in the report recently submitted to the EUB by the Sulphur Recovery Guidelines Review Group and its conclusions regarding more rigid enforcement by the EUB of its gas plant proliferation policy (this report is available on the EUB's Web site at www.eub.gov.ab.ca, Sulphur Recovery Guidelines Review <bbs/products/report/srgag-2000-04.pdf>);

- possible extension of the gas plant proliferation policy to sour gas wells and pipelines; and
- greater use of mitigative measures, such as directional drilling, pipeline corridors, staged or phased development, and buffering techniques.

4.2.2 EUB ROLE

Introduction

The results of the telephone survey on the role of the EUB indicate that those who had contact with the EUB respecting sour gas and public health and safety in the past year were generally satisfied with the contact. However, there was considerable critical comment from outreach participants about the EUB and how it carries out its role and, in some cases, suggestions that this role was not well understood.

A few of the participants in the outreach process from industry made comments somewhat critical of the EUB that were; in part, consistent with those made by participants from the public. They suggested that more enforcement by the EUB would help to level the playing field.

Outreach participants made numerous other comments regarding the EUB role including the following:

- Lack of sufficient regulations.
- Concerns with the EUB's enforcement and the complaint response processes.
- Not enough inspections and too much reliance on self-regulation.
- Communications between the EUB and the public need to be improved.
- Need for more qualified EUB field staff.
- Lack of interaction between the EUB and the public, including Aboriginal people (the Aboriginal communities were often not aware of the EUB role or jurisdiction).
- The EUB is often vague and unresponsive.
- The EUB's hearing process is too time consuming and expensive for the public.
- Better coordination is needed among the EUB, industry, government and the public to improve the effectiveness of the regulatory process.

Having regard for all of these matters and with the knowledge that the role of the EUB has changed significantly in the past five or so years, the Advisory Committee concludes that the EUB is doing a reasonable job, but there is room for improvement and a review of its role is timely regarding the following:

- content of the regulations.
- effectiveness of the field surveillance system and other enforcement measures.
- application and decision process.
- interaction with stakeholders. and
- involvement with Aboriginal people.

Major Driver Issue: The adequacy of the EUB approval and regulatory systems for sour gas as they relate to public health and safety.

Statements of Direction

Regulations

Some of the participants in the outreach program commented on the content of the regulations related to sour gas and public health and safety. Most comments were general in nature regarding the need for more regulations. There were some specific comments on emergency response and setbacks. (See Sections 4.2.6 and 4.2.9).

Some areas the Advisory Committee believes should be addressed are

- integrity of old sour pipelines
- third party damage to pipelines
- old standing sour wells, and
- conversion of facilities from sweet to sour operations

The Advisory Committee is considering recommendations to better ensure that the regulations are sufficient to protect public health and safety in these areas. This would include increased pressure testing when converting pipelines to sour service and more stringent drilling requirements when the target is sweet gas or oil but sour gas may be encountered.

Enforcement

The EUB, like most regulatory authorities, relies heavily on industry to manage its activities to comply with the various regulations and directives. Many refer to this as self-regulation. However, many outreach participants expressed the opinion that industry self-regulation is not sufficiently validated through a process of EUB compliance audits. Moreover, concern was expressed that the EUB is slow to respond to complaints, while at the same time placing too great a reliance on complaints as the basis for enforcement.

In light of the concerns regarding enforcement, the Advisory Committee requested and heard from the EUB about its enforcement and compliance process. The EUB defined self-regulation as a means for industry to be proactive in ensuring that its operations meet requirements, realizing that it is being held responsible and accountable for the condition of those operations.

The Advisory Committee determined that the EUB has an extensive enforcement system and publishes an annual report outlining the results of its enforcement programs.

The direction of the recommendations by the Advisory Committee will be towards a greater involvement of EUB field staff in sour gas matters. This would include

- increased inspections and audits of sour gas facilities;
- increased inspections of critical sour wells being drilled;
- higher priority for sour gas complaints and more timely reports back to the complainants;
- greater involvement in resolving concerns and disputes respecting sour gas;
- more priority on enforcement and more severe penalties in areas where sour gas poses a higher threat to public health and safety; and
- making information respecting the results of inspections and audits of sour gas facilities more readily available.

The Advisory Committee expects that implementation of its recommendations could require an increase in the number of experienced EUB field staff and, perhaps, changes to where they are located throughout the province.

Applications and Decisions

Many comments and concerns were raised respecting the application and decision processes of the EUB, including

- contents of applications for sour gas facilities, and the manner in which applications are processed;
- the hearing process, including how decisions are made and the report issued respecting those decisions;
- whether the EUB has sufficient expertise to make sour gas related decisions, particularly in matters such as health;
- criticisms regarding the appearance of bias by the EUB; and
- criticisms that the EUB favours industry and resource development and ignores views of the public.

The Advisory Committee is considering recommendations that will provide the following directions:

- An increased focus on the contents and review of sour gas facility applications, including more information on project area plans and having EUB staff conduct a more detailed and earlier review of critical sour well and facility applications.
- Developing a less formal and more user-friendly hearing process.
- Clarifying of jurisdiction roles and improving application-related communication among the EUB, municipalities, and regional health authorities, including early involvement in policy-making and decisions.
- Increasing involvement by EUB staff in mediating sour gas application disputes.
- Increasing recognition and attention to public views and providing a better explanation of the manner in which the public interest is determined in decision reports.

- Ensuring EUB access to sufficient expertise to fully assess public health, safety, and public interest matters.

The Advisory Committee believes that recommendations of the nature outlined previously respecting EUB enforcement and applications and decisions will address the matter of appearance of bias to a significant degree. Other specific recommendations are being considered that would result in the EUB placing greater emphasis on its role as a regulator on behalf of the public, particularly as it relates to public health and safety.

Interaction with Stakeholders

The role of the EUB is unclear to some of the public. The credibility of the EUB is questioned when some members of the public view the EUB as an industry advocate. To increase the understanding of the role of the EUB and for better client service, improvements are needed.

As a result, the direction of the intended recommendation of the Advisory Committee will be for the EUB to:

- Strengthen relationships with stakeholders in the public consultation area, perhaps through forming a public consultation team, recognizing that improving the EUB's role as an unbiased source will take time.

- Improve communication material, both print and electronic. For example, the EUB should develop a brochure that is made available to the public and that focuses on its sour gas role. The brochure needs to be clear, succinct, and kept up to date. It would also be distributed to municipalities, government agencies, and involved community groups. It could include a checklist of what the public needs to consider asking the oil industry during public consultation respecting sour gas.

Involvement with Aboriginal People

There is uncertainty respecting the jurisdiction of the EUB with respect to the lands of First Nations. It was clear from the meetings with Aboriginal representatives that the EUB and its role are not well known in Aboriginal settlements. These concerns are addressed in the direction statement in Section 4.2.12, Aboriginal (First Nations and Metis) Issues.

4.2.3 MONITORING

Introduction

Some outreach participants expressed concerns about the adequacy of monitoring of concentrations of sour gas and other associated pollutants and the reporting of the monitoring results. In particular, questions were raised about monitoring during emergency episodes, as well as monitoring of complaints and compliance, and of human exposure. There was a common theme that there is insufficient air quality monitoring being done and that results are not readily available to the public. Some said that current monitoring systems are not sensitive enough to

measure low levels of H_2S and SO_2, and others said that not enough of the pollutants that may pose a threat to health are being measured.

Major Driver Issue: The adequacy and coordination of public health and safety related monitoring programs for sour gas and associated pollutants, and the reporting of monitoring results.

Statements of Direction

Many activities associated with the development of sour gas resources have the potential to release substances, such as H_2S and SO_2, into the environment. These releases may be operational (e.g., blowdown of pipelines), emergency or episode related (e.g., blowouts) or ongoing (e.g., routine flaring). The Advisory Committee recognizes that monitoring strategies and programs are necessary to determine if these releases are adversely impacting animal and human health or the environment. It also recognizes that monitoring programs and capability need to be continuously evaluated and improved to reflect new issues concerns and advances in monitoring technology.

The Advisory Committee assessed the current monitoring activities associated with sour gas development and identified five general types of monitoring. These are

- Emergency/episode response monitoring.
- Human/animal exposure monitoring.
- Complaint response monitoring.
- Routine/ongoing monitoring.
- Special study/research-type monitoring.

Emergency/episode response monitoring and human/animal exposure monitoring are considered directly relevant to the public health and safety mandate of the Advisory Committee, which focuses on possible short-term (acute) rather than long-term exposures of people to sour gas related releases. The other types of monitoring are generally directed at longer-term, lower-level (chronic) exposures and impacts.

The Advisory Committee believes that it's environmental and exposure monitoring recommendations should focus on

- ensuring the availability of adequate monitoring capability in terms of numbers of monitors, detection capability, and the ability to measure different compounds, in order to be able to respond quickly and efficiently to emergency/episode release events;

- ensuring that the monitoring roles and responsibilities of all parties are clearly understood and well coordinated during an emergency/episode release event;

- using personal exposure monitoring in certain circumstances to measure the actual concentrations of sour gas constituents to which people are being exposed;

- using monitoring programs and systems to track and assess health effects associated with acute exposures. such as knockdowns: and

- undertaking monitoring programs. as necessary. to improve understanding of the immediate or long-term health and environmental effects of short-term exposures to sour gas and to assess the appropriateness of related current health and environmental guidelines and standards.

The Advisory Committee is also anticipating some recommendations on complaint-related monitoring and long-term monitoring programs and capability. These recommendations will likely focus on

- ensuring a good complaint response monitoring capability and
- ensuring that there is a surveillance and network- monitoring program to provide good information on general air quality in areas with significant sour gas development.

This monitoring should include Aboriginal lands, as appropriate.

4.2.4 JURISDICTION

Introduction

Many participants in the outreach process expressed concerns about coordination among various agencies involved with sour gas development. It was also observed that mechanisms for managing the overlapping/complementary jurisdictions of various agencies in public safety and sour gas were not clear, often contributing to confusion as to which agency they should call. A few people indicated that when they contacted staff from one agency, they were advised that their particular concern was not an area dealt with by that agency, which contributed to the public's impression that agencies were passing the buck. This results in loss of credibility and lack of confidence in the regulatory system. Some suggested that health officials need to play a greater role in sour gas decisions.

Activities related to sour gas, from initial licensing to abandonment and reclamation, require the input or involvement of various agencies. While in most cases the final decision-making authority for sour gas facilities rests with the EUB, other agencies may have an interest or some regulatory responsibilities. This creates a potential for jurisdictional overlaps and a need to ensure that all interested agencies are appropriately involved.

Major Driver Issue: The need to integrate and coordinate government services and regulations regarding the approach to sour gas development, including the need to recognize the roles and interests that other government agencies may have respecting sour gas, while still ensuring an effective and efficient regulatory regime. (Examples of other agencies include regional health authorities, First Nations, Alberta Environment, Alberta Health and Wellness, Municipal Affairs, Municipalities, Indian Oil and Gas Canada, Workplace Health and Safety, Disaster Services.)

Statements of Direction

The Advisory Committee examined the legislation related to sour gas to get an appreciation of the involvement of agencies over a variety of stages in the lifecycle of a sour gas facility and identified some possible areas for improvement. As a result of its review, the Advisory Committee believes that its recommendations related to jurisdiction should focus on

- ensuring that the responsibilities and relationships of federal and provincial government agencies, regional health authorities, and municipalities are clear and overlaps are minimized;
- where overlaps do appear to exist, ensuring that the jurisdictional relationships are better understood and integrated, and that formal working agreements are developed where appropriate;
- clarifying the role and responsibility of the federal government for First Nations health and safety related to sour gas;
- involving relevant agencies, such as regional health authorities, in establishing standards and policies that can be used to consistently evaluate individual applications;
- developing and defining appropriate one-window concepts; and
- clarifying to the public and industry the roles and responsibilities of the government agencies involved in sour gas and public health and safety.

4.2.5 INDUSTRY PROCEDURES AND PERSONNEL

Introduction

Many outreach participants raised concerns respecting the sour gas and public health and safety related procedures and equipment used by industry and the personnel responsible for those procedures and equipment. There was little specific comment on the equipment and procedures, but some emphasized that industry should use the best available technology, procedures, and equipment, regardless of cost.

The major areas of concern related to the training and reliability of workers and to the attitudes and philosophies of management regarding public health and safety.

There were some comments on sour gas pipelines and changing from sweet to sour operations. These are dealt with in Section 4.2.2. Others related to industry's role in emergency response are covered in Section 4.2.6.

Major Driver Issue: The adequacy of industry sour gas procedures and personnel to maintain public health and safety.

Statements of Direction

The Advisory Committee reviewed the current regulatory requirements regarding sour gas procedures and training and believe that they are generally adequate. with the following exceptions.

The Committee is considering recommendations in the direction of

- ensuring that sour gas drilling operations and other industry practices maintain pace with technology and operational developments;

- greater assurance that all relevant industry management take sour gas issues and concerns more seriously and impart that position and attitude to all personnel involved. This should be reflected in the choice of equipment and procedures. the overall approach to public health and safety. and the manner of dealing with the public; and

- improving the training and knowledge of sour gas workers (company personnel. contractors. and those working in sour gas fields) to clearly recognize the dangers to themselves and the public from sour gas and to be familiar with proper procedures to minimize sour gas hazards.

4.2.6 EMERGENCY RESPONSE PLANNING AND PREPAREDNESS

Introduction

Emergency response plans (ERPs) and emergency planning zones (EPZs) are required by the EUB and seen by the Advisory Committee as means of protecting the health and safety of those living near sour gas development that may be directly affected by an accidental release. A standardized approach for establishing EPZs is used. The Advisory Committee reviewed the EUB's existing requirements for emergency response planning and preparedness and believe they are comprehensive and well documented.

However. a number of participants in the outreach program raised concerns including

- the standardized approach for determining EPZs, maintaining that it results in an arbitrary radius and does not adequately consider such site-specific factors as weather, wind, topography, proximity to population, and other community issues;

- the scope, effectiveness, and quality of ERPs and the adequacy of the size of the planning areas;

- the lack of appropriate coordination with other relevant plans (e.g., municipal and industry ERPs), involvement of stakeholders and agencies;

- resident information packages;

- availability of resources, capability to implement the plans, testing and exercises of the plans, and appropriate training for all responders; and

- inadequate EUB review and enforcement regarding ERPs and the company's ability to put them into effect.

Based on the Advisory Committee's random sample telephone survey, most people affected by an EPZ believe that the plan provides a sense of safety. However, many did not believe that they are kept current with changes to the plan and most of them have not had the plan or response actions explained to them by the facility operator.

While a few did indicate that their experience working with industry on ERPs had been positive, a number of individuals expressed concerns about such items as

- the absence of phones and related technology in some areas,
- language barriers,
- inability for evacuation because of dead-end roads, and
- poor to no response when calling a company emergency telephone number.

Major Driver Issue: The adequacy and coordination of emergency response planning and preparedness to ensure a high level of public health and safety.

Statements of Direction

ERPs are recognized as an integral part of public safety as it relates to sour gas development. The Advisory Committee believes that ERPs need to contain information and criteria that ensure they are effective in providing a maximum level of public safety should an incident occur. Issues such as ignition criteria, evacuation, and sheltering need clearly defined triggers that remove any discretion that might lead to delays in initiating any of these actions. Also, the EUB must ensure that ERPs are complete and operational and that the company has the resources and trained individuals to implement the plan.

The Advisory Committee believes that another key area for improvement in the development of ERPs is in coordination of all potential responders to an emergency, including industry, municipalities, regional health authorities, provincial and federal government agencies, First Nations, Metis, and the EUB. This is necessary to identify and maximize resources, define roles in the event of an emergency, and minimize public safety risk. In areas with intensive sour gas development and where there are several operators there should be coordinated ERPs that allow for clarity of roles and communication to the public, as well as consideration for emergency response "co-ops." The Advisory Committee is moving in a direction to better ensure that all of these parties have the resources to carry out their roles and that they cooperate with each other in doing so.

The Advisory Committee is considering recommendations to have the EUB better define a series of EPZs to strengthen the effectiveness of emergency response and further improve the protection of public safety. Actions in the EPZ immediately surrounding the well must be immediate and effective, but other zones, such as the awareness zone further out from the well, must not be ignored, and appropriate preplanning and coordination among all potential responders must take place. Additionally, the Advisory Committee would see strengthening of

the EUB's current regulations and role to provide clear. prescriptive requirements that cover matters such as

- plan approval. auditing. and enforcement programs:
- handling of situations where the operator changes because of ownership change or other reasons:
- plan validation via responder training and plan exercises with tests of all aspects of the plan. including communications. and involving all relevant responders. such as municipalities:
- ensuring that applicants are capable of carrying out plans:
- better definition of plan requirements within the EPZ. the awareness zone. and beyond:
- potential emergency response approaches outside both the EPZ and awareness zone in conjunction with other relevant responders, including municipalities:
- annual review and update requirements, including individual resident details and other users of land (such as forestry, trappers, surface mineral claims. licence of occupations):
- evacuation, ignition, and sheltering requirements;
- criteria for introducing a planning zone that is reduced from that determined by dispersion modelling;
- clearer definition of the additional requirements and special planning necessary where an applicant proposes a "reduced" EPZ:
- integrated plans for circumstances when one hazard (H_2S) is converted to another (SO_2) as a result of ignition to ensure that an ERP exists for the new hazard;
- the need for a better understanding and clarification of SO_2 evacuation criteria in ERPs:
- more specific detailed requirements for resident information packages and the timing of their availability;
- expectations for the operator to consult with potential responder authorities and agencies to agree and document roles and responsibilities;
- the need for the operator to identify resource needs and where these resources are currently situated and provide reassurance that they can be available when and if needed;
- encouragement for operators to establish mutual aid agreements or emergency response "co-ops" in areas with intensive industry activity and multiple operators (similar to Western Canada Spill Services for oil spill response);
- encouragement for operators to coordinate mutual aid with other industries (such as forestry sector, petrochemical industries) in emergency response planning;
- definition of requirements for "post-event" debriefs and follow-up activities; and
- specific details addressing how isolated communities and individuals (such as trappers. Aboriginals, farmers, and transients) are handled, including those where there is a lack of cellular coverage causing communication delays.

4.2.7 UNDERSTANDING OF HEALTH EFFECTS

Introduction

The Advisory Committee heard concerns from many public outreach participants respecting the degree of understanding of the effects of sour gas mixtures (particularly SO_2 and H_2S) on the health of humans, including those with special sensitivities. In addition, of those surveyed in the random sample telephone survey, only 44 per cent indicated that they somewhat or strongly

agreed with the statement "scientists have a clear understanding about the effects of sour gas on public health", while 24 per cent somewhat or strongly disagreed.

Many in the public believe that there is a lack of human exposure monitoring and testing of short-term episodic events and that standards are not stringent enough, especially in view of the concentration of several facilities within a localized area. This is seen to be even more problematic because of the lack of scientific data regarding the relationship of cumulative effects to human, animal, and environmental health. It was suggested that there should be more research into cumulative effects and its associated risks.

Health effects were a dominant issue for participants in the public outreach program. Although the Advisory Committee's mandate was limited to a review of immediate or long-term effects of short-term exposure to sour gas, it heard many concerns about long-term effects of long-term exposure to low concentration levels of sour gas mixtures. Also of significant concern was the impact to human and animal health from the cumulative effects in a localized vicinity of sour gas development.

The Advisory Committee's work included a detailed questionnaire sent out to a number of experts on toxicology. Public comments appeared to agree with the wide divergence of views of the experts consulted on the nonlethal effects. Therefore, the Advisory Committee believes that overall there is a low level of understanding and confidence regarding health-related information used by regulators and the industry in making decisions that may affect public health and safety.

Major Driver Issue: The adequacy of our understanding of the health effects caused by sour gas mixtures.

Statements of Direction

- Lethality of H_2S

Through expert responses to the questionnaire and other work, the Advisory Committee believes the approach to considering lethal effects recommended by the Energy Resources Conservation Board (ERCB; now the EUB) in 1990 continues to be a reasonable predictor of lethality (ERCB, 1990, Report 90b, Vols. 5 and 7) for emergency response planning purposes. It is the Advisory Committee's view that the EUB's approach to determining EPZs (e.g., for wells a 100 parts per million (ppm) H_2S [3 minute average] isopleth is used) is reasonable and provides a good basis for any adjustments using revised models. An isopleth is the distance at which a specific concentration could extend.

- Nonlethal Health Effects

There is a wide divergence of views from recognized experts on the nonlethal health effects, both temporary and irreversible, of acute exposure to H_2S, SO_2 and other constituents of sour gas. The different views of the experts, along with the limited scientific information available, make it difficult to assess whether the current approaches are adequate. Differing views of the experts, as well as variation in the manner that the EUB has applied this information, have created confusion and eroded public confidence in the sour gas regulatory environment intended to protect public health and safety.

The Advisory Committee received little information from the experts with respect to SO_2. The health effects of SO_2 are relevant, as ignition of H_2S releases is sometimes used as a mitigative measure. This converts H_2S to SO_2.

To address these concerns, the Advisory Committee is considering recommending that a revised comprehensive health effects table be developed as soon as practical. The table would cover both the constituents of sour gas mixtures and the products of incomplete combustion of sour gas, including SO_2, reduced sulphur compounds, and possibly complex hydrocarbons. A multi-stakeholder team could be struck to develop this information, which might be published as part of a "primer" that addresses the important health-related questions the public has about sour gas in a manner understandable to the broad public. It could perhaps be an update of the 1988 Alberta Health and Wellness pamphlet titled *Guidelines for Action Regarding Hydrogen Sulphid.* (this pamphlet is available from Alberta Health) The revised health effects table would then be used in decision or policy making by the EUB and other Alberta departments and agencies involved in the regulation of sour gas. The Advisory Committee is of the view that a revised comprehensive health effects table is an urgent matter. As a first priority, the multi-stakeholder team would be asked to determine if any interim changes to the standards are justified pending the completion of the full review.

Although the Advisory Committee is aware that there have been recent reviews about health effects of low-level exposure to H_2S and SO_2, it believes that important areas to be addressed include the lack of:

- peer-reviewed research,
- measurement of exposure concentrations and times, and
- coordinated follow-up on those exposed.

The Advisory Committee is considering recommending that the multi-stakeholder team identify further research focused on nonlethal toxicological effects needed to improve understanding of how people and animals might be affected. The Advisory Committee is aware that the detailed multi-government *Western Canada Study on Animal and Human Health Effects Associated with Exposure to Flare Emissions* (a draft document outlining the scope of this project can be found on the Advisory Committee's Web site at www.publicsafetyandsourgas.org) research project has recently begun. Any research recommended by the Advisory Committee should complement this and other ongoing research. The focus could be on the nonlethal effects of short-term acute exposures related to events that threaten public safety.

Section 4.2.3, Monitoring, also outlines some health related matters.

4.2.8 TECHNICAL KNOWLEDGE

Introduction

The first line of defense against sour gas impacts on public health and safety is the prevention of sour gas releases. However, in the event that a release does occur, we need to predict what could happen and understand the uncertainty associated with our predictions. Many stakeholders expressed a lack of understanding and confidence in the dispersion modelling and risk

assessment methods used by regulators and industry to make decisions about EPZs. setbacks. and other measures intended to protect public health and safety. Some of the public outreach participants suggested that there has not been sufficient research or a successful track record in the use of risk and hazard assessment related to sour gas operations.

A number of public outreach participants suggested that there was a wide variation in the results of dispersion modelling and risk assessments performed by different experts. The public questioned how. with this variation. reasonable decisions could be made by the EUB about public health and safety.

The Advisory Committee believes that dispersion modelling and risk assessment are important elements in protecting public health and safety because they provide the scientific basis for assessing what happens when sour gas is released to the atmosphere and people are exposed. They will be addressed as two separate sub-issues:

- Dispersion Modelling
- Risk Assessment

Major Driver Issue: The adequacy and understanding of the methods and mathematical models used in assessing potential effects on public health and safety from sour gas developments.

Statements of Direction

Dispersion Modelling

Dispersion modelling is a method for estimating the dilution of a release by atmospheric air and the extent of impact from a release. The computational complexity of the atmospheric dispersion models makes the details and results difficult to understand. The Advisory Committee noted that there is disagreement among experts about

- the suitability and applicability of certain dispersion models,
- how sensitive the models might be based on input data. and
- the level of expertise required for their use by the EUB and others.

As a direction the Advisory Committee intends to ask the EUB to take steps to work with experts, the public, and other stakeholders to adopt a standardized approach for selecting and using dispersion models for sour gas releases. he models would be mathematically and physically sound and would include the following

- published specifications for standardized assumptions used in adopted models;
- improved modelling of pipeline blowdown, well release rates and other inputs; and
- setting EPZs with consideration for site-specific topographic and atmospheric conditions.

Risk Assessment

Risk assessment is used to calculate the chances of a release occurring and the public health and safety consequences of exposure to sour gas. The Advisory Committee believes risk assessment plays a valuable role for the public, industry, and regulators in understanding and evaluating the potential impact of existing or proposed sour gas facilities and alternatives on public health and safety. To enhance the usefulness of risk assessments, the Advisory Committee believes steps should be taken to eliminate from the public consultation and hearing processes the frequent and sometimes counterproductive argument surrounding the variables used in the analysis.

The Advisory Committee is considering asking the EUB to work with other stakeholders to develop a standardized approach to risk assessment that will allow all parties to understand the differences between alternative proposals. In developing this proposed direction, the Advisory Committee consulted with and was given consistent advice from several independent experts in risk assessment. The Advisory Committee believes that a standardized approach to risk assessment might include

- accepted specifications for assumptions used in the recommended risk assessment procedure,
- a standard method to evaluate and quantify probability of failure,
- development of updated sour gas release incident databases that are user friendly and publicly available, and
- a clear explanation of what the assumptions are and how the results are used by decision-makers, in a form understandable to all stakeholders, particularly the public.

4.2.9 SETBACKS

Introduction

A setback is the minimum distance that must be maintained between an energy facility (i.e., well, pipeline, gas plant) and a dwelling, public facility, rural housing development, or urban centre. One important reason for the establishment of setbacks is to create a buffer zone between an energy facility and other surface development (i.e., residence). Setbacks for sour gas facilities are categorized into four levels. Minimum setback distances are reflected in a chart (EUB Interim Directives ID 81-3 and ID 97-6), which considers both the category of sour gas facility and the type of existing or proposed surface development in proximity to the proposed facility. These minimum setbacks are applied to both oil and gas development and surface development.

In addition to the setbacks regulated by the EUB, some municipalities establish "nuisance" (i.e., dust, noise, visual) setbacks larger than those of the EUB to restrict land development near sour gas facilities.

Some of the public participants questioned the reasonableness of the setbacks currently used by the EUB. Their general view was that the criteria used to establish setbacks are not well understood and that overall they are inadequate. During the public outreach discussions, many participants expressed concern that the minimum setbacks for sour gas facilities are too small and that they should be increased. However, in the random telephone survey, 48 per cent of rural

respondents who have land affected by a sour gas setback believed the distances are reasonable, while 30 per cent did not.

Some public participants suggested that setbacks need to be more site specific and that regulations should consider factors such as topography, long-range urban development plans, adjacent landowners, settlement patterns, weather, company performance, risk and hazard assessment, and consequences of an incident. There is also a perception that a rural resident is considered to have less value than an urban resident based on the setback criteria.

Some participants commented about the impact of setbacks from sour gas facilities preventing certain types of surface developments. They questioned the fairness of these restrictions, particularly when a landowner suffers a demonstrable loss due to a setback from a sour gas facility.

The Advisory Committee believes it should address the following setback sub-issues:

- criteria for setbacks, and
- effects of setbacks.

Major Driver Issues: The need for and the basis of establishing setbacks as a means of protecting public health and safety from sour gas development.

Statements of Direction

Criteria for Setbacks

The Advisory Committee engaged a number of experts to assist it with this complex subject. After its consideration of the matter, the Advisory Committee believes that once a standardized dispersion model and risk assessment methodology are finalized (as suggested in Section 4.2.8, Technical Knowledge), they should form the basis for a detailed re-examination of the current sour gas setbacks. This should be done through a multi-stakeholder process including representatives from the relevant regulatory agencies, government departments, municipalities, health authorities, general public, land development industry, and oil and gas industry.

Objectives should be to determine if

- the current approach to setbacks is appropriate,
- the number of levels of categories is acceptable,
- the actual setback distances are appropriate, and
- a common set of setback distances can be agreed upon by different jurisdictions.

Effects of Setbacks

Setbacks can effectively sterilize land from certain uses until such time as the well or facility has been abandoned and reclaimed to regulatory standards. In most cases, the landowner on whose land the facility is located negotiates surface rights access with the respective oil and gas developer. In certain cases, however, landowner ability to develop (as conferred by a municipal

development plan. area structure plan. or other municipally approved documents) may be impacted by a setback caused by a sour gas facility. Some see this as an unfair effect of setbacks.

As indicated in Section 4.2.1. Development Planning. the Advisory Committee is moving in the direction of better early planning between the surface and subsurface owners to try to minimize conflicts between people and sour gas. Further. the Advisory Committee believes that there could be a specific expectation that sour facilities be located. when possible. so as to not result in the setbacks crossing adjacent property boundaries. This would help ensure that a landowner affected by the setback is in direct discussions with the oil and gas developer regarding surface access. but may be inconsistent with the aims and objectives of some surface rights groups respecting the siting of facilities.

The Advisory Committee believes that the problem of the effects of setbacks on the ability to proceed with certain surface developments and possible solutions requires further study and evaluation. The Advisory Committee is considering recommendations towards the formation of a multi-stakeholder group to deal with these issues.

4.2.10 PUBLIC CONSULTATION BY INDUSTRY

Introduction

Most outreach participants expressed concern that there was a lack of consistent interaction between the public and industry to keep the public informed about operations in their area and to help resolve concerns about sour gas development. Many stated that industry's poor public communications (especially the initial contact by land agents) is a consistent problem. They said that they did not trust industry because promises were often not kept. Some companies were difficult and frustrating to deal with, and arrogance and intimidation from some companies was not uncommon. Some were critical that land agents were simply looking for quick signatures at the lowest cost possible.

Many of the outreach participants indicated frustration by an apparent lack of empowerment and respect for individual rights and concerns and suggested that this has contributed to health concerns among individuals and communities. There is a need to ensure that acceptable public consultation practices are being followed by all of the industry.

A few added that companies were often more communicative during the development of new sour facilities than they were once their development was in production.

Some industry and public participants in the outreach process indicated that difficulties between industry and the public are specific to certain companies, and that other companies consult and communicate effectively.

Many of the outreach participants said that the effectiveness of the communication about the risks related to sour gas activity is not good. Risk communication and consultation are imperative to improve understanding. The information needs to be more user friendly and not include so many technical terms. Respondents expressed concern that they are not receiving

complete information, that the risks are downplayed. and that they are being misled. Credibility of communication is an issue.

Many people mentioned that communication regarding emergency response plans is poor. A few suggested that the current approach used by industry to provide information about the emergency response plan increases public anxiety.

Most of the outreach participants suggested that there is an overall lack of public awareness of the decision-making process and contact information. and that this needs to be resolved. People should be made aware that they do have the opportunity to provide input into the application review and decision-making processes.

Results of the random telephone survey found that most of those involved in public consultation related to sour gas issues believed that the process does reduce public anxiety. However. when asked about the degree of satisfaction with the responsiveness of industry to concerns within their community, approximately one-third of the respondents to the telephone survey indicated that they were either very dissatisfied or somewhat dissatisfied.

Most Aboriginal communities also expressed concern regarding their lack of knowledge and the timeliness of involvement in sour gas operations in their areas.

Major Driver Issue: The lack of consistent and appropriate public consultation by the industry to help resolve concerns about sour gas development, the lack of understanding as to what benefits related to sour gas development flow back to the community, and the need to encourage ways that both industry and the community can work together to assess both the benefits and the negative impacts.

Statements of Direction

In the past, the EUB has encouraged industry to use appropriate public consultation practices for sour gas development. The Advisory Committee is aware and supportive of industry efforts to improve in this area, including the development by the Canadian Association of Petroleum Producers (CAPP) of a *Guide for Effective Public Involvement* (available from the Canadian Association of Petroleum Producers) in 1998. However. more needs to be done, and the Advisory Committee believes that this "encouragement" has not been sufficiently effective.

Additionally, industry, the provincial government, and municipalities must do a better job of researching and defining the benefits of sour gas development to local areas. When more clearly defined, the balance between negative impacts and benefits can be more clearly assessed and communicated.

The direction of the intended recommendations of the Advisory Committee will be to ensure that public consultation is a requirement for sour gas development, rather than only strongly encouraged. This could involve

- developing an EUB informational letter for early, effective public consultation that is in the form of a requirement by industry rather than a "guideline";
- encouraging the EUB to have a staff resource team that focuses on public consultation to assist industry in providing a more consistent approach to the public including Aboriginal people;
- developing a set of public consultation practices endorsed by both the EUB and industry that encourages decision-making processes where the public has input so they are kept more informed and involved;
- ensuring that EUB public consultation resource materials are updated and key messages are clear, understandable, and succinct, including providing a new checklist to the public on what questions they should ask during consultation with industry and a summary of the rights of both surface and sub-surface owners; and
- having industry, the provincial government, and municipal representatives conduct a study to better define local benefits (such as property taxes and local business opportunities) from sour gas development and communicate the results.

4.2.11 PUBLIC AWARENESS AND UNDERSTANDING

Introduction

Most participants in the outreach process expressed concern about the lack of awareness and opportunity for education regarding sour gas issues. Concerns included difficulty in accessing information, the general lack of public awareness, the uneven playing field regarding public consultation, misinformation, the lack of informed public participation in decision-making, and concerns about getting consistent information from the media, industry, the EUB, and environmental groups.

There is generally poor understanding of scientific information and safety-related information requirements, such as emergency response planning and preparedness, determination of emergency planning zones and their purpose, setback distances, dispersion modelling and risk assessment. This lack of understanding reduces confidence that the EUB or industry can ensure adequate public safety.

Most participants indicated a need for better understanding and awareness of potential public safety and sour gas related issues and therefore a need for readily available information that is fair and accurate. Many said that current communication about the risks related to sour gas activities is not effective and that people should be better informed. Information should be user friendly and written in understandable terms. Some outreach participants stated that there is a need for credible information by an independent source that is clearly written and understandable.

Most people also suggested that there is an overall lack of public awareness about the EUB's decision-making process. Some participants felt that there is a need for more understandable information regarding regulations and that EUB decision reports are difficult to understand and should be written in plain language.

Most of the Aboriginal outreach participants suggested that there is very little public awareness within their communities about the issues related to sour gas. Some suggested that community workshops would be beneficial for raising public awareness.

The results of the telephone survey indicated that there was good general awareness of sour gas issues in the areas sampled. However, respondents also felt that the communication mechanisms among the public, the regulator, and companies could be improved, as they believed that information was not adequate or readily accessible.

Major Driver Issue: Lack of public awareness and understanding regarding sour gas issues.

Statements of Direction

The Advisory Committee is aware of communication initiatives including the development of the *Sour Gas Questions and Answers* Backgrounder by the Petroleum Communication Foundation (copies are available from the Petroleum Communication Foundation). This information is helpful but does not go far enough in addressing the need. Accordingly, the direction of the intended recommendations of the Advisory Committee is towards the following:

- Formation of an information office, located either within or independent of the EUB, and possibly supported by a stakeholder committee. The role of this office would be to provide credible, unbiased information related to sour gas development; act as a key contact for referring the public to the right source of information; help build trust and understanding among industry, the public, and the EUB; and liaise with stakeholder groups throughout the province.

- Training, perhaps leading to certification, might be offered to industry in risk communication methodology and emergency response consultation, so that the information sent out by companies is more understandable.

- Informational sessions could be conducted for the public and Aboriginal people specifically focusing on building understanding of sour gas development.

- Preparation by the EUB of material (i.e., brochures) providing clear information on technical matters such as ERPs, EPZs, setbacks, rights of surface and subsurface owners, and standardization of the requirements for the information package given to the public living within an EPZ.

- Preparation of an EUB brochure containing information about risk, using understandable language, that sets out what risk assessment is, when it is applied, and what needs to be considered. This would be part of the package given to the public during the public consultation process.

4.2.12 ABORIGINAL (FIRST NATIONS AND METIS) ISSUES

Introduction

Many of the concerns raised in the Aboriginal communities were similar to those raised by other participants in the outreach process. Therefore, a number of the directions outlined in the preceding sections also address those concerns. However, some of the concerns raised by Aboriginal people were unique to their communities and are addressed in this section. Additionally, there is uncertainty respecting the jurisdiction of the EUB with respect to the lands of First Nations. For these reasons and for the convenience of the Aboriginal people, the Advisory Committee is including here, all of its comments and directions that relate specifically to the issues raised by the Aboriginal communities.

It is clear from the meeting with Aboriginal representatives that the EUB is not well known in Aboriginal settlements. Aboriginal representatives expressed strong desire respecting the need to develop emergency response plans, and they raised questions regarding the role the EUB might play in that regard. Another matter frequently mentioned was the desire for better understanding of sour gas and the role of the EUB as a regulator. The Advisory Committee's consideration of each of these concerns is complicated by the jurisdictional uncertainty.

Major Driver Issue: Lack of awareness and understanding among Aboriginal people regarding sour gas related issues and the role and relationship between the EUB and other relevant provincial and federal departments including Health Canada and Indian Oil and Gas Canada.

Statements of Direction

Interaction with the EUB

The EUB, as the lead regulator for sour gas development in Alberta must improve its relationship with Aboriginal people. The Advisory Committee believes that the increasing concern Aboriginal people have regarding sour gas development and its potential impact on health and safety, as well as traditional lands and sacred sites, might be effectively addressed by the following actions

- The EUB would engage appropriate staff to ensure more interactions among the EUB, Aboriginal communities, and industry. These staff would ensure that informational sessions were designed and conducted for Aboriginal people, specifically focusing on building understanding of sour gas development, and would assist industry in providing a more consistent approach with Aboriginal people.

- Additionally, the EUB might consider forming an Aboriginal advisory committee to better ensure that Aboriginal issues are recognized.

Other directions the Advisory Committee is considering in the area of interaction with the EUB are presented in Section 4.2.2.

Emergency Response Planning and Preparedness

The Advisory Committee believes that another key area for improvement as it relates to Aboriginal people is in the development of emergency response planning and preparedness programs. These programs would in turn provide for the coordination of all potential responders to a sour gas emergency on or adjacent to Aboriginal communities. Special consideration would have to be made for language barriers, lack of technology, such as cellular coverage causing communication delays, and isolated communities and individuals (hunters, trappers). The Advisory Committee is considering recommendations which would see the EUB take responsibility for initiating a process to achieve this direction.

Other directions the Advisory Committee is considering in the area of emergency response planning and preparedness are presented in Section 4.2.6.

Jurisdiction

The area of jurisdictional responsibility is a complex one regarding Aboriginal people, especially First Nations, in part because of the role of both the federal and provincial governments. The Advisory Committee believes this could be a barrier to improving Aboriginal people's understanding regarding sour gas development, where and how to raise complaints and concerns, and how to properly responded to incidents that may have an impact on health and safety. As a direction, the Advisory Committee is considering recommendations towards

- a greater sense of clarity in the relationships among federal and provincial government agencies, Aboriginal people, and adjacent municipalities and minimization of gaps and overlaps in jurisdiction; and

- ensuring that an effective complaint/incident response program exists with clear jurisdictional lines that would have monitoring capability as well as ensuring surveillance and network monitoring programs that provide information on general air quality in Aboriginal communities with or adjacent to significant sour gas development.

Other directions the Advisory Committee is considering in the area of Jurisdiction are presented in Section 4.2.4.

4.2.13 IMPLEMENTATION

The direction in which the Advisory Committee is moving with respect to consideration and implementation of its recommendations is to request that the EUB issue public quarterly status reports on what has been done respecting each recommendation until action has occurred on all recommendations.

4.2.14 NON-MANDATE BUT IMPORTANT ISSUES

Many concerns were raised that relate to matters either unrelated to sour gas and public health and safety or related but excluded from the mandate of the Advisory Committee because they are being addressed by other initiatives. These concerns are summarized in Appendix C, Sections V and VI. The Advisory Committee recommends that the EUB and others involved in or subject to

the regulation of the oil and gas industry review these concerns and explore how these issues could be addressed.

Some of the non-mandate issues were raised by many participants and, in the view of the Advisory Committee, are of particular importance if the EUB is to address the concerns that led to the formation of the Advisory Committee. For these important non-mandate issues, the Advisory Committee may, in its final report, offer comments, as opposed to recommendations.

Examples of issues that it may address with comments include

- flaring,
- monitoring of long-term, low-levels of H_2S or SO_2,
- research on health effects from long-term, low-level exposures,
- protection of ground water,
- compensation, and
- definition of local intervener and intervener funding.

APPENDIX F
REACTIONS TO DIRECTIONS DOCUMENT

1. Introduction

The Advisory Committee on Public Safety and Sour Gas spent many months reviewing and examining the current sour gas development regulatory framework. In addition, the Committee conducted a thorough public outreach program designed to gather the concerns and issues of Albertans regarding the exploration, production and transportation of sour gas. The Committee documented its findings in a Directions Document that was released for public comment in the fall of 2000. The Directions Document summarized all the Committee learned about sour gas and provided some insight into the direction the Committee was leaning towards for its final recommendations to the EUB. The document and response forms were made available by mail, on the Committee's website, by telephoning a toll free number or in person at public forums.

In October, the Committee held a second round of public meetings to get reaction to the Directions document from participants in the earlier outreach program. The Committee wanted to know from Albertans if what was in the Directions Document reflected accurately what it heard, and secondly, if the direction specified for each of the issues met people's expectations. To accomplish this, meetings were held at Edson, Leduc, Drayton Valley, Rocky Mountain House, Sundre, Grande Prairie, Red Deer, Calgary and Pincher Creek. As well, there were a series of separate meetings with First Nation and Metis groups throughout the province. Supplemental to this input, the Committee received 39 response forms and 37 written submissions.

2. Summary of Public Comments

Appendix C reflects what the Committee heard in its initial outreach process. Appendix F provides an overview of the public's reaction to the Committee's Directions Document. For each of the 14 topics identified in the Directions document there is an overview of the public's "General Comments", a "Sample Comments" section and the identification of any "New Concerns" if applicable. There was no attempt by the Committee to edit the flavour of the public's comments and in many cases they are given verbatim as they were presented.

- It should be noted that any "New Concerns" are not necessarily shared or endorsed by the Committee; rather they are merely presented as not having been raised in earlier outreach efforts.

2.1 Development Planning

Most respondents indicated general agreement with the directions for development planning. In addition, a number of specific comments about the two sub-issue directions were made and are highlighted below.

Coordination of Surface and Subsurface Planning and Development

General Comments

Directions pertaining to the coordination and integration of planning, changes to the mineral leasing system and modification of the existing Crown Mineral Disposition Review Advisory Committee generated the most comments.

Most respondents supported the coordination and integration of resource and municipal development plans. It was recognized that some municipalities are better resourced to address these issues than others. A few respondents expressed concern that there are currently too many jurisdictions involved. Suggestions included the inclusion of inter-municipal development plans, the need for development plans for municipal districts, and standards for development in populated areas.

Respondents expressed concerns with the recommendation to change the mineral leasing system. The main concerns were sterilization of potential sour gas areas, excessive delays in accessing the resource and the difficulties with sharing subsurface information given the competitive nature of the mineral leasing system in Alberta.

Sample Comments

Co-ordination and Integration of Planning

- There is a need for regional planning which takes all considerations into account.
- Alberta municipal districts should also be responsible for developing and submitting development plans.
- There is a need to create resource development plans for extraction resources. These plans need to consider present and future demographic change and boards should govern these plans in each rural area.
- Standards for development in populated areas need to be established. This will ensure that once mineral rights are sold a company has a high degree of comfort that the resource will be accessible. If development restrictions are put in place, then mineral rights should not be posted for sale. Any new development restrictions should entitle rebates to the mineral rights holders.
- Add Inter-Municipal Development Plans (IDP) to the list of plans that should be coordinated. IDP plans are well suited to establishing appropriate policies for sour gas development near populated areas. The IDP could define a geographic area where the delineation and rapid recovery of sour gas resources would be encouraged. Mineral leases located within this defined area should be caveated to inform the resource industry that significant timing, design, and/or location restrictions may be required for lease agreements. The use of the IDP in conjunction with similar provisions as stated in ID96-1 would provide a workable template in coordinating and integrating municipal and resource development planning.
- Disagree with the proposed direction – SPOG's new development process is an example that can deal with the directions outlined in this section.

- Until there are integrated plans that provide parameters to levels of impact from any one activity in concert with all others, planning will be inadequate. I would hope the EUB would demonstrate leadership by delaying development pending such planning.
- Needs to include companies working together to avoid piece meal approach.
- Allow only one or two facilities per 100 square miles.
- Development of sour gas wells should never be allowed in areas near large urban and city populations.
- Towns and MD's that benefit from plans and wells are not willing to question the health effects from these facilities.
- Add farmers and landowners as levels that should be involved in coordinated planning (major driver issue).

Changes to the Mineral Leasing System to Minimize Sour Gas Wells and Other Related Facilities

- Change the existing mineral leasing system to minimize the number of sour gas wells and facilities.
- This modification could result in widespread sterilization of potential sour gas areas or excessive delays in accessing the resource. The current competitive nature of the mineral leasing system in Alberta will make extensive sharing of subsurface information between companies difficult, especially early in the life cycle of an exploration play.
- The mineral leasing system should not be altered as it has implications for the competitive nature of the oil and gas business. There are many technical arguments that are part of the discussion of how many wells it takes to effectively drain a sour gas reservoir. These issues should be left to the technical expertise of the EUB and the proponent as an item of consideration when granting specific well licenses. Benefits of the current approach include encouraging innovation, creativity and risk taking (geological) and high returns to the province through rights.
- Discussions should occur at the time of the granting of leases. It too late to do this once the issue is under the jurisdiction of the EUB. Conditions on lease timing and extraction responsibilities tied to the lease should be the starting point for EUB regulatory functions. The onus should be on the Province to declare the importance of the resource and on municipalities to express future growth and development plans
- Public needs to have input before mineral leases are granted as well as during discussions about any changes to the system.

Other

- The Crown Mineral Disposition Review Advisory Committee should not be the vehicle to determine the possible impacts of sour gas development on public health and safety. This is better facilitated through the expanded use of community/industry organizations and processes.
- Re: Crown Mineral Disposition Review Advisory Committee – There is a lack of stakeholder or public input on all subject areas not just safety.
- There is contradiction between the directions to minimize the amount of wells and to delineate and recover sour gas reserves in a timely manner. Minimizing well production will prolong the process. Minimizing should refer to surface facilities only.

- Real estate brokers should take a more active role in familiarizing themselves and sharing information about past, present and future oil and gas developments.
- Seismic issues and work need to be better coordinated. Seismic issues should be within one department's mandate. Seismic regulations need to be more stringent.
- No plan to ensure long term affordable supplies to support community stability. Proven supplies should be recovered over a much longer period (100 years) instead of 15-20 years (Swan Hills)
- Need to discuss the link between topsoil real estate and bottom soil rights.

New Concerns Raised

Concerns were raised about the lack of coordination of seismic work and associated seismic issues.

Subsurface Resource Planning and Development

General Comments

Most respondents supported the gas plant proliferation policy as well as more rigid enforcement of this policy. Concerns about extending the gas plant proliferation policy to other facilities included the potential for stifling competition and jeopardizing free enterprise. It was acknowledged that there could be better optimization of sour gas pipelines. There appeared to be general support for greater use of mitigative measures, although there were some concerns about specific measures such as staged or phased development and directional drilling. Suggestions included analyzing measures within a consultative framework and establishing more stringent standards when leases are granted.

Sample Comments

Proliferation Policy

- Density of oil and gas wells is a concern – cumulative emissions become unacceptable
- Need to be more stringent and have stricter rules – involve the municipality
- Leases sold by the province are stratified and this leads to a proliferation of facilities.
- Support gas plant proliferation policy but not the extension of this to wells and pipelines as this could significantly stifle competition and jeopardize free enterprise.
- Conditions on facility proliferation should be declared when leases are granted. Companies could compete for managing the extraction of resources for others. Time limits could be placed on leases and lease renewals to synchronize with municipal development expectations.
- Proliferation policy should not be extended to wells but there may be better optimization with regards to sour gas pipelines.

Mitigative Measures

- Need to analyze planned mitigative measures within a consultative framework in order to avoid trading impacts between stakeholders.

- More stringent standards could be established when leases are granted. These could be context based, taking into account proliferation of facilities, intensity of population development, and proximity of high animal husbandry populations in addition to the size and type of facility.
- Increased use of pipeline corridors could result in longer pipelines and an increase in both cost and risk.
- Staged or phased development should be approached with caution. It could have unintended consequences resulting in gas resources not being recovered such as the possible use of new technology that could create opportunities in an area scheduled to be phased out.
- Directional drilling is trespassing.
- Need forced pooling across sections, not only within one section of land.

Other

- One means of getting past the confidentiality in the early stages of reservoir developments is unitization. This is not the form that is done after the pool limits are established. Units would have to be formed early and quickly with the focus on accepting and expediting major additions to a unit as development proceeds. The key for this is an effective formula for adding new lands.

New Concerns

If changes to lease sales are made, how will the appropriate agency be influenced? What are the mechanisms for referrals to other parties?

2.1 EUB Role

General Comments

This topic generated considerable public response. Although many respondents expressed general support for the directions there were a number of specific comments and concerns. The most comments were made about the directions concerning application and decision-making.

There were few comments about regulations and there appeared to be agreement that some regulations should be reviewed. There were concerns with the perception that the industry may set its own regulations – respondents indicated that the industry operates within a highly regulated framework.

Responses to the enforcement direction were mixed. Some believe that enforcement is adequate but that this needs to be better communicated. Others expressed the need for more enforcement, while others suggested that emphasis on due diligence will accomplish more than inspections/enforcement. There were a couple of suggestions that EUB field offices should be more involved in enforcement and in using a risk-based model.

A number of respondents expressed support for, and concerns with, the directions for applications and decision-making. Most respondents appeared to agree that the hearing process should be improved to make it more efficient, less antagonistic and less cumbersome. Some

respondents indicated that there should be more information available to help people decide whether or not to intervene e.g., past precedents. There were mixed opinions about the inclusion of other parties. Concerns were that this would compromise the one window approach. It was also suggested that changes should await a review of the recent *Report for Implementation of an Appropriate Disputes Resolution System.*

In terms of interaction with stakeholders, respondents appeared to support clearer standards for industry, better communication materials and an enhanced facilitation role for the EUB.

Sample Comments

Regulations

- We question the need for more stringent drilling requirements. On what basis or evidence would these changes be needed? The EUB has recently published guidelines (revised Guide 56) whereby anything above zero ppm H_2S would now be considered sour. Was this not intended to address the public consultation issues around possibly encountering slightly sour zones? There should be more detailed assessment of actual problems encountered with drilling standards before contemplating escalating the standards.
- How can you expect more stringent drilling requirements when 'sour gas may be encountered" – does this not mean that such requirements should be routine?
- We agree that some specific regulations should be reviewed. However the qualifier of "old" for pipelines represents an example of a potential disconnect from actual performance. The directions might more accurately focus on corrosion control system performance as it applies to all sour pipelines rather than using only age as a higher risk indicator.
- We do not agree that the industry is "self-regulated" since this implies that industry sets regulations, which is clearly untrue. We find the industry to be subject to one of the highest levels of regulation in the world.

Enforcement

- More enforcement will not necessary result in improvements in public perception. Broader communication about current enforcement activities is necessary before increasing the current levels. The recently implement enforcement ladders (EUB) need more use and evaluation before additional changes are imposed.
- There has been a significant increase in field inspections by the EUB from 1997 to 1999 (nearly doubled). Inspections results indicate that industry compliance with regulations increased considerably in that time. We support the EUB's focus on outcome-based surveillance, in particular the use of operator history and inherent risk when determining which facilities to inspect.
- We support the suggestion for more visibility and presence of EUB staff in the field.
- The final report should clearly indicate the current scope of regulatory requirements and enforcement efforts before making recommendations.
- Given the EUB's lack of responsiveness to fugitive emissions in the Enchant area, it is difficult to accept the enforcement directions as presented.
- Need more enforcement by the EUB and media articles on this.

- The EUB region offices should be using a risk-based model to determine the priorities for inspection.
- Increasing inspections will not necessarily strengthen the EUB role. Inspections are a good performance-monitoring tool but lasting improvement is best obtained through attitude and due diligence.
- Comments were made under the Enforcement section that a higher level of involvement by the field staff regarding sour issues is needed. At the present time operational issue involving sour well drilling, sour plants or batteries inspections, and pipeline construction and failure investigation have a high priority while complaint investigation regarding sour operations at the EUB is a number one priority. The comments in the Directions Document imply differently.

Applications and Decisions

- Significant sour gas facility applications cannot be left to an 'after the fact" audit process.
- Decisive enforcement should be seen in action, at least on occasion, when a clear direction needs to be set, or where there is a blatant abuse of the regulations. Hearing and inquiries and subsequent decision reports serve this purpose.
- Recommendations should be specific in clarifying for the public the regulatory responsibilities of participating government departments and agencies in the sour gas development continuum. As a minimum there should be an easily understood matrix identifying responsibilities by jurisdiction and coordination requirements.
- The process has become very adversarial and revisions to the decision-making process are warranted. We would support the development of alternative processes that are more in step with the additional public involvement and consultation associated with regulatory applications.
- We would support the need for a less formal and more efficient decision-making process that compliments the EUB hearing process. We would be supportive of any initiatives that would help to clarify with the public the need to differentiate between impacts related to project specific applications versus broader industry issues that are beyond the reasonable scope for an applicant to address. The EUB decision-making process does not use precedents so it becomes extremely inefficient to continually debate the same issues over each individual application.
- There are opportunities for standardization of approaches e.g., a record of EUB decision on common issues could help potential interveners by letting them context the validity of their issues against current EUB positions and precedent decisions. This may also assist in efforts for effective alternate dispute resolution as it adds an incentive to negotiate.
- The application process would also benefit from having similar expectations of industry and the public when the EUB entertains applications and interventions. More onuses should be placed on stakeholders to provide significant evidence or justification for project specific concerns before hearings are granted or applications approved. Right now the interveners/objectors do not have to meet any requirements for supporting information standards to establish the merit of the objections. The substance behind a "directly affected party's" claim of adverse impacts currently does not have to be supported in any fashion. This results in the inefficient use of the EUB hearing process.
- Any alternate means of resolving disputes would be an improvement over the existing hearing process. Hearings tend to polarize issues and positions. It is difficult to see how a

resident and a company are expected to develop a working relationship after going through a process where the parties have been antagonists.

- Avoid being overly prescriptive in the application process. as flexibility to accommodate site specific needs is imperative.
- It would be helpful to have criteria for screening interveners and contain the scope of hearings regardless of the level of consultation that proponents have initiated. Without this EUB role, consultation and dispute resolution efforts are diluted for those proponents that are fully engaged and this could discourage future efforts.
- We support the direction to clarify jurisdiction, roles and application-related communication among the EUB, municipalities and regional health authorities. However we believe that the role of the EUB as the "one window" approach to regulator is critical.
- We support the committee directions on clarification of roles relative to public health authorities with early involvement in policy making and decisions – this is sufficiently vague at this time and interpretation of this statement will make for interesting dialogue.
- The EUB should hire an independent "oil and gas industry Medical Health Officer" who could act independently but consistently in supporting RHA's in their role of maintaining public health.
- We believe that the "Report for Implementation of an Appropriate Disputes Resolution (ADR) System" already addresses the development of a less formal and user-friendly hearing process. Establishment of an ADR process combined with an enhanced mediation role for EUB field staff is intended to make the process more user-friendly. Further changes to the system should wait until the regulator; public and industry have had a chance to see how this approach works.

Interaction with Stakeholders

- We are very supportive of the EUB developing clearer standards for companies to follow. It is imperative that these standards be established with stakeholder input. However once these are in place, then a company meeting these expectations should be acknowledged during the regulatory application review process with a reasonable expectation of expeditious application approvals.
- We suggest that the EUB take an active facilitation role similar to the CASA model for stakeholder involvement. This can best be accomplished through industry/community organizations. Each EUB area could facilitate an active industry/community group that is appropriately resourced for the purpose of providing the forum for development planning discussion and dispute resolution.
- Improved communication materials (specifically the suggested checklist for landowner about what to expect from industry during public consultation) will be helpful.
- We support a core skill within EUB staff on facilitation of public involvement committees. The Board has a huge ability to create and influence community involvement groups, and create consistency throughout the province e.g., have a SPOG type community involvement group for each EUB region.
- There needs to be a clear understanding within the public that the EUB role is to balance between the needs of the province as well as the individual.
- Three important principles for the EUB to adhere to:
- Transparency: to know the structure
- Accountability; of the government and industry to the people

- Redress: go and look at an issue once damage or suffering has occurred and have the ability to redress it.
- The EUB needs to play a stronger role in mediating disputes also at the operational stage. They EUB needs to hear and support the people.

Other

- An environmental auditor position is needed.
- EUB should be dismantled and replaced with something effective. EUB and Alberta Environment could be merged into a new organization.
- Any recommended change in the EUB's role, the manner in which industry is to be regulated or monitored, or the degree of involvement of EUB staff in ongoing communications with the public will require an appropriate level of staff – with appropriate expertise.

New Concerns

There were no new concerns other than specific concerns related to the directions, which are indicated above.

2.3 Monitoring

General Comments

Although there was general support for the directions, there were mixed reactions to the monitoring direction. A number of respondents thought it important to build on and support recommendations from the work of CASA and regional air shed monitoring initiatives. Some suggested that quicker response and mitigation of odours (e.g., industry coordinated call-outs), performance bonds, and better communication about existing monitoring would help. Others thought that more on-site monitoring should be implemented.

Sample Comments

- Industry and government have spent millions of dollars studying and monitoring H_2S and SO_2. The directions don't appear to flow out of any scientific basis and clearly fail to recognize some of the leading edge systems that have recently been put in place. The work of multi-stakeholders to establish air shed monitoring zones with state-of-the-art equipment is not acknowledged. We would support recommendations that look to making enhancements to these existing networks.
- We question the scientific premise behind the recommendation for what appears to be epidemiological studies related to individuals with short term exposure to sour gas given the extensive research conducted under the ADRP.
- We agree that monitoring of air quality impacts can be improved. We strongly support the recommendations made by the CASA Human Health and the Acidifying Emissions Committee in this regard.
- It would be prudent to allow the monitoring work being done in the Air Management Zones to mature before additional recommendations are made for monitoring

improvements e.g., new technologies being considered for the Western Canada study might be helpful for use in the regional monitoring zones.

- Odour complaints are the single most frequent area of complaint registered by the public with the EUB. Industry must work to continuously improve its response and mitigating of odour causing events. A particular challenge in effective response is monitoring for impacts and identification of sources. The committee could reinforce the call for research through the Petroleum Technology Alliance Canada organization.
- By working with an industry coordinated system of callout, operators can respond quickly to odour complaints regardless of cause. Follow-up with complainants is essential.
- We believe that additional monitoring may address some of the public concerns. We also believe that better communication of the current monitoring efforts and results would help reassure the public.
- Mention should be made of the Clean Air Strategic Alliance (CASA) Human Health Monitoring Group report of 1998. This contains a recommendation for he development of a province-wide process that would answer the needs expressed in the document.
- While we support the general direction of additional monitoring, it raises the question of who does it and how is it paid for. We believe that general ambient monitoring not related to or required for specific facilities, should be the responsibility of the regulators and coordinated through the CASA process.
- The Directions Document appears to impose additional responsibilities on the EUB and other government departments or agencies. Specific recommendations should be made to:
- Clearly define the responsible agencies involved in sour gas monitoring
- Establish a review process involving the responsible agencies that ensures close coordination of monitoring resources, information and activities.
- Impose a duty to sufficiently fund new monitoring and research programs on the EUB or specific government agencies.
- Clearly define for the public, in language that is easily understood, any new monitoring programs and the hierarchy the EUB and government agencies involved with those programs.
- The where, what, when, how, how much and by whose actions or inactions, is pertinent to good incident reporting at organized 24-hour hot lines.
- Field readings must be made with activated monitoring equipment, located in the predominantly downwind sectors of subject facilities, pinpointed and mapped by satellite survey technology for the duration of enough "better and worse" cycles. Wind tunnel modelling may add to overall insights.
- Performance bonds for diligent and careful adherence to standardized procedures need to be attached to all oil/gas related work.
- A multi-stakeholder group should be established including technical expertise to deal with the information in this section.
- Mobile monitors and all different kinds of monitors should be used; static monitors should be put right at the plants with monitoring trailers at sites, so that the source can be tracked.

New Concerns

There were no new concerns but many reiterated the need for more site-specific monitoring.

2.4 Jurisdiction

General Comments

The involvement of municipalities and other jurisdictions generated considerable comment. Although many supported this there were also a number of concerns about creating an additional process, adversarial relationships among these participants, fragmentation of the process, loss of the one window approach. Likewise there were concerns that health authorities and direction are not receiving sufficient attention.

Sample Comments

- We support the EUB one window approach only. The EUB should strengthen its role and involvement with other government agencies.
- Municipalities and other appropriate jurisdictions shall be involved in developing EUB policy appropriate to their jurisdictions but we do not wish to create an additional review and approval process for the oil and gas industry.
- We fully support the direction indicated by the committee in this area. We emphasize the effectiveness of the "One Window" approach where the EUB act as regulator using standards set by other agencies. This model clarifies requirements, sets accountability, timelines and allows firm and fair enforcement.
- We do not support fragmenting the approval process. While we recognize that other agencies have legitimate interests in the activities of the sour gas industry, we believe these can be accommodated within the existing system.
- We do not believe that it is helpful to have the regional health authorities participate in hearings as an adversarial intervener. The current situation where the health authorities challenge EUB policies and standards at hearings significantly affects the credibility of the whole process. The health authorities should be provided an opportunity to input to the standards and regulations early in the process and then let the EUB regulate. If there is a concern regarding the expertise of the EUB on toxicological matters, it may be appropriate to bring this expertise directly into the EUB.
- We do not support the development of additional approval processes to the current EUB one-window process.
- The Public Health Act is very purposefully structured to have primacy over other legislation to ensure that the public's health is being protected. Executive Officers are diligent in the performance of their duties. If any attempt were made to undermine this responsibility/duty, the industry would potentially be subjected to greater and not lesser scrutiny from the public health community. The EUB and industry must acknowledge that Alberta Health and Wellness does not speak for the public health community in Alberta.
- Jurisdictional clarity is essential in re-establishing public confidence in the regulatory system. Specific recommendations should be made to:

- Confirm the pre-eminence of the EUB within the sour gas well development application and approval process.
- Establish a review process that will clarify and where necessary, specifically confirm the boundaries of other provincial entities. Emphases should be placed on formalizing these boundaries within working agreements and within the regulations as required. This clarification/confirmation should include publication of such information for he public in language that is easily understood.
- With respect to the development of sour gas, industry should only need to look at one regulatory body – the EUB. How the EUB interacts with government departments is its decision.
- Avoid raising jurisdiction as an issue. Rather, deal with specific issues – identify who is interested and bring these people together.
- As recommended – involvement of MD, AHA, Disasters Service should have equal parts. EUB should not have final jurisdiction as opposed to our Health and Wellness authorities.
- If the EUB cannot control the applicant and guarantee safety they should give all control over to the federal authorities, police etc.
- There should not be integration of government agencies.

New Concerns

- Where does the Canada wide accord on environmental harmonization produce by the Canadian Council of Ministers of the Environment fit into this picture?
- Trucking of sour fluids and the associated odours cause by it and the jurisdictional problems associated between the EUB and Alberta Environment were never raised. This is an area that the EUB and Alberta Environment should come to agreement on. In many cases odours from trucking are blamed on sour plants that are not associated with the trucking incident.
- I encourage a review of the actual authority the EUB has on First Nation Lands to required compliance to EUB directives/guidelines.
- It was heard that the EUB is not enforcing regulations on Reserve land because they believed the federal government was doing it but the federal government believed the EUB was doing it.
- There is a need for clarification of roles with the Indian Oil and Gas Commission and the EUB.

2.5 Industry Procedures and Personnel

General Comments

Although the directions were generally supported by most respondents, a number of respondents thought that industry was already maintaining pace with technology, taking sour gas issues serious and appropriately training sour gas workers. A few respondents indicated that Alberta is internationally recognized for its sour gas safety record. Examples of technology advances and training initiatives were provided. It was indicated that the existing directions and regulations just need to be enforced. However, there were also concerns that industry's procedures are compromised by shortages and inconsistency in staffing, contractors' behaviour and insufficient attention to following procedures.

Sample Comments

- We do not support the direction that implies the industry is not keeping up to advances in technology. Our safety record suggests the opposite. Our industry standards for H_2S training and awareness are well established. The greatest risk from sour gas operations is to our workforce not the public. Our industry does not take this responsibility lightly.
- Alberta has developed worldwide recognition as a leader in safe sour gas operations using Industry (Alberta) Recommended Practices (IARP). The recommended practice, *Drilling Critical Sour Wells* is being revised to include the latest best practices and technical advancements such as sour service drill pipe metallurgy and specific experience requirement for rig personnel that the committee suggests is needed.
- Regarding the suggestion to improve the training and knowledge of sour gas workers, we believe that this is current industry practice. Specifically, PITS runs many safety-related courses. One key course is *H_2S Alive*. This is the industry standard training for petroleum industry workers who could be exposed to H_2S. In addition to safety training, PITS offers training and certification in a number of drilling and well service programs. For critical sour well, specific experience requirements for supervisors, rig crew, service personnel and safety specialists are given in EUB ID 97-6 Sour Well Licensing and Drilling and these requirements are being enhanced in the revision to the Alberta Recommended Practice. There is an industry initiative underway to collaboratively examine ways to improve contractor safety performance. CAPP and many individual member companies have joined Alberta Government's *Partnerships in Health and Safety Program*.
- Industry has an excellent safety record with sour gas development. The committee should only recommend that the EUB continue to enforce existing regulations.
- If the EUB is going to ensure industry "maintains pace", what benchmarks or regulatory justification will be used? How does the EUB gain "greater assurances" that the industry is taking issues more seriously? Improved training standards imply a regulatory approach should be taken. If this is the intent, the industry and other stakeholders should be involved in a review process to ensure adequate involvement.
- Emphasis should be placed on hiring qualified and experienced persons.
- Sour gas training is not adequate as the document states. Training should be provided free for the public who live hear facilities.
- There needs to be incentives so that workers follow the proper procedures – not just know them.
- Persistent shortage of first line supervisors and intermediate managers, in the wake of ongoing, global dehiring rages, makes it impossible to train and retain enough recruits at basic, intermediate and advanced levels of field work. PITS can only do so much.
- SPOG companies take training of their workers very seriously when it comes to sour gas, and continue to try and improve our dealings with the public. SPOG believes that industry could improve contractor behaviours with respect to dealing with the public e.g., seismic, trucking etc.

New Concerns

- Old pipes are time bombs.

- Need better maintenance of recovery systems in old fields because industry won't pay to replace or repair old pipes that are only needed for a few years.

2.6 Emergency Response Planning and Preparedness

General Comments

This topic generated considerable response. Although the general response appeared to be supportive there were a number of specific suggestions and concerns. Most respondents supported enhanced coordination with other agencies but there were questions about the cost implications and the range of emergency response capability across the province (i.e.. smaller companies. municipal districts). Some people indicated a desire to see the cost estimates for the proposed initiatives. There was also support for standardization of processes and terminology.

Sample Comments

- The EUB role can be strengthened.
- Current EPZs are based on dispersion models and limited toxicity data. The awareness zone or notification area should not be arbitrary.
- Requirements for transients like fishermen may need to be strengthened.
- Need more emphasis on high standard of construction and maintenance.
- Need ability to immediately ignite any released gas.
- Generally agree except if the calculated EPZ impinges on a densely populated area. a reduced EPZ should not be granted and the well should be moved to avoid the impingement or not drilled.
- Change the "encouragement" to pursue mutual aid to a requirement.
- We support recommendations that would lead to more effective and coordinated response among industry, government and the public.
- We do not support the establishment of "Emergency Co-ops" similar to oil spill co-ops. This is not a responsibility that should be outsourced.
- We are very supportive of mutual aid groups.
- We have serious reservations about the directions for emergency response outside the awareness zones. This would introduce another large element of uncertainty around how big a zone, what criteria determines this additional area and what expectations would be created within a community.
- We are concerned with the directions concerning training, ERP requirements, EPZ calculation and resident package information. The report implies that either none of these exercise are currently in place or are not satisfactory. The EUB regulatory requirements are quite explicit and industry standards are well established in these areas.
- This section would benefit from the inclusion of statistics about blowout numbers, activation of ERPs per 1000 wells drilled, etc. There is the potential to over-manage this issue, to the detriment of having sufficient resources to manage other sour gas components.
- The EUB should have the staffing levels to allow review of all facility ERPs before the facility is operated.

- We consider Emergency Response Planning and Preparedness a key competency for operators, which requires clear accountability and effective enforcement, to ensure performance standards are met consistently.
- Standardization of processes and terminology, used for emergency response be all sectors across Alberta, is an area that must be improved.
- CAPP is supportive of the general direction to strengthen, clarify, and ensure enforcement of the regulatory requirements regarding emergency response planning and preparedness. Two documents, currently being prepared, (the EUB's *Emergency Response Planning Guide* and CAPP's *Emergency Response Planning Guidelines for the Western Canadian Upstream Petroleum Industry*) are meant to work together to define the regulatory requirements and provide information on how industry can best meet these requirements. Modification of these documents would be an effective way to address the directions of the Advisory Committee.
- We are concerned with the inference that the EUB is responsible to ensure that ERPs are complete and operational and that the company has the resources and trained individuals to implement the plan. We believe that this is the individual company's responsibility and accountability. CAPP does support the proposed direction that the EUB validate and approve ERPs via auditing training and exercise rather than the current practice of only reviewing the hard copy ERPs.
- EPZ distances will need to be reassessed once the dispersion modelling and risk assessment directions are addressed. Specific requirements for ERPs on sour wells are given in EUB ID 97-6 Sour Well Licensing and Drilling.
- The consultation of the company/operator with affected stakeholders on their proposed ERPs should occur in the plan development phase.
- The proposed requirements that ERP exercises involve potential responders must recognize the wide variance of resources availability between companies and municipalities across the province. There are a number of small companies and municipalities that may not be able to meet the proposed requirements.
- Where smaller municipalities cannot adequately address the requirements of ERP due to insufficient resources, will the EUB or Alberta Disaster Services be required to assume this responsibility?
- The recommendations should outline a clear procedure for those instances where affected stakeholders cannot agree on ERP components.
- All of the proposed directions imply participating stakeholders, including municipalities, will be required to shoulder increased costs. The recommendations should also include sources of funding to respond to these increased costs. The recommendations would result in: greater participation by more agencies on a continuing basis, an increase in provincial staff, quality and frequency of training and communication, increase costs to the public. Cost implications should be included with the recommendations.
- As long as there are any difficulties in getting through to helpful EUB and WCB hot-line operators with alerts or complaints, it stands to reason that ERP will fall well short of the expectations the current EUB and WCB policy/vision statements suggest.
- SPOG agrees strongly with effective ERP planning and implementation including ERP drills. All stakeholders including the public should be invited to participate. The biggest efficiency improvement that could be made is for the government to standardize the use of the Incident Command System in Alberta. This will facilitate a better integration of all parties involved with an ERP.

- SPOG is supporting a pilot where five member companies are using one visit approach to resident ERP updating. This results in a common method of data collection and minimizes resident disruption.
- SPOG is working on integrating with other government agencies such as municipalities, disaster services, etc. to coordinate public data which can be used for mapping, GPS, real time tracking, etc.
- Oil and gas companies should be required to co-ordinate ERPs with local municipal authorities (disaster services) and be responsible for all costs of services, supplies and other expenses associated with a hazardous incident.

2.7 Understanding of Health Effects

General Comments

This topic generated a large volume of comments, many reiterating concerns about their personal health and the need for action. Although most respondents seemed to support the general direction there was no clear consensus on the specific direction statements.

There was controversy about whether or not more research is needed. Some indicated that all that is needed is better dissemination of existing research. There was a concern that the approach to this topic needs to be from a risk/hazard perspective. The Committee was urged to direct the retrofitting of existing facilities. Concern was expressed that future research could focus on short-term, high-level exposures rather than chronic low level exposures. Although a revised health effects table was supported, there were concerns that there is not sufficient information to prepare one. There were questions about the membership of the proposed multi-stakeholder team that will determine if changes to the standards are justified.

Sample Comments

- Any cause and effect studies must take into account other influences such as more cars, coal burning, global effects, etc.
- What is lacking is not research but adequate dissemination of research.
- The lack of scientific data on non-lethal effects is a major weakness.
- Does the information exist to prepare a comprehensive health effects table?
- There appears to be contradictions between the observations and the directions. The contention is that there is little expert information on SO_2 yet the recommendation is to revise the comprehensive effects table. From where is the information for this table going to come? We do not support the recommendation for more research without more recognition and a through assessment of the studies completed and ongoing. We question if this is a communication issue not a knowledge gap.
- Much data is available since 1990 to suggest, actually to mandate that releases from wells and collections should not exceed 1 ppm (not 100 ppm for three minutes)
- Nothing advocated can solve the hydrogen sulphide problem unless it forces compliance from all sour gas facilities, old and new.
- The retrofit of all existing wells, gathering systems and refineries to safe release standards is essential and must be done quickly. The present grandfathering certification of hazardous sites cannot be condoned in the court of world opinion.

- The entire report fails to face the rapidity that hydrogen sulphide spreads when released. Buffer zones must be large to give minutes of safety if spread is at 20 mph. which equals 29.3 feet per second. or at 60 mph which is 88 feet per second. Gas masks would be useful if the alarm system goes off promptly.
- Adverse health effects are assured from levels of hydrogen sulphide above 1 ppm for even short periods and from a few minutes of 20 ppm. Hydrogen sulphide is a deadly poison for the human brain.
- Information is available in other countries.
- Area does not need more study. It needs action and education.
- I do not feel the committee provides leadership here because it does not investigate the issue from a hazard/risk perspective. Given the issue of concern really relates to a long-term, low exposure scenario I recommend the committee either describes the issue accurately before making any recommendation or refer it to an expert group to provide the description.
- I question the statement "lack of scientific data" – there is a large collection of available data. which if properly present and discussed could resolve many of the concerns raised. The committee should discuss these issues, maybe with international experts in the area. before recommending additional studies in an area so poorly defined and discussed.
- I strongly agree with the last sentence if it means than an aggressive public outreach program to address the low level of understanding should be initiated.
- I do not think that there is a wide divergence of views about non-lethal effects among experts. There are some differences but not as stated in the document. I believe the committee would change its conclusions if it were to organize a meeting of experts and ask those questions.
- The section on lethality of H_2S mixes hazard and risk. The hazard of lethality is a fact; whereas the way lethality data are interpreted into an EPZ is a risk decision. I do not disagree that the 100 ppm isopleth may be appropriate, but in some circumstances other levels or averaging times may be equally appropriate.
- There is much data available on SO_2 – numerous published papers have been written, peer-reviewed summaries exit, and there are a number of international experts.
- I disagree with the comment about the "lack of peer-reviewed research". There is always a need for more research, but this does not mean we do not know a lot about H_2S even now.
- A broader analysis of the current science and proposed research is necessary before specific recommendations are advanced.
- We support the direction to develop a revised comprehensive health effects table along with the need for additional research. In this regard, it is interesting to note that the recent Michigan Environmental Science Board study Health Effects of Low-Level Hydrogen Sulphide in Ambient Air (August 2000), found the "no observable adverse effect level of H_2S in ambient air to be between 2 and 10 ppm".
- We do not agree that "scientists have a clear understanding about the health effects of sour gas on public health". The Alberta Lung Association has done extensive work with a committee comprised of experts from industry, government, academia and the ENGO community, to identify knowledge gaps related to human health effects, attributable to exposure to H_2S. This committee identified eleven knowledge gaps including the need to determine no and low adverse effects.

- Monitoring data is relevant only when there is sufficient knowledge about what constitutes a safe level of exposure.
- We are frustrated that a large amount of money will be spent on an animal health study, when we have been unable to secure minimal funding for a human health study.
- Clearly the most important public safety concern relates to chronic low-level exposures yet the report indicates that future research could focus on short-term, high-level exposures.
- The precautionary principle needs to be the driver and part of adoption of a precautionary approach is to accept the more conservative of the opinions, or at least have a forum which brings experts together to discuss this in an objective fashion (not a predominately lay committee deciding on what they believe are the expert opinions).
- I am not prepared to "negotiate" levels of human health protection, even if the EUB was to distribute its own table.
- The table must integrate low dose long-term exposure.
- Who is the multi-stakeholder team that will determine if changes to the standards are justified? What authority do they have to dictate health levels?
- We need to comment on whether or not the Western Canada Study will meet the needs.
- A timeframe should be established for completion of the multi-stakeholder review of the current health effects table (suggest one year from commission date). This review process should become a continuous process with mandated reviews or revisions on a two, three, or five year cycle. Knowing that the effects of both gases are being evaluated on a recurring basis by health and government officials may help increase public confidence.
- All incident reports should be taken by EUB and WCB personnel who would time-date, map, code, correlate and coordinate the needed follow-up.
- After examining the *Proposed Western Canada Study* I believe that if it goes ahead as planned the data will be inconclusive. They do not know what "biomarkers" they should be checking for. Biomarkers should be located first so that they know what types of tests to do on the humans or cattle. They should be looking for evidence of critical enzyme depletions, percentage of abnormal hemoglobin, neurotransmitter depletion etc.
- A multi-stakeholder group needs to address the information in this section. The group's first step should be to look at past research/reports, which is what CASA is doing currently. There is new and progressive research being conducted, two examples are the University of Calgary calf exposure to H_2S study and the Western Canada Cattle Study – these and any other studies should progress to their conclusion.

New Concerns

- Make recommendations to EUB concerning groundwater/oilfield-related pollution in the Carstairs area.
- Personal illness from living in the Pincher Creek area. Failure to follow up on health studies conducted in the Hillspring area over 20 years ago.
- Health Canada should become involved.
- There are concerns about health effects among the Blood and Peigan people. There are common ailments such as respiratory problems, allergies, sinus problems etc. There are also concerns about livestock, water quality, etc.

2.8 Technical Knowledge

General Comments

Of those respondents who completed response forms, the majority indicated general agreement with the directions concerning technical knowledge. Standardizing risk assessment and modelling methods was generally supported, but there were concerns about eliminating arguments about the variables used in risk assessment from the public consultation and hearing processes. Some respondents believed it critical that the public is involved in these discussions. Some respondents made suggestions about how to approach the development of standardized approaches.

Sample Comments

- The standardized method to evaluate and quantify probability of failure should also include consequences.
- It is essential that the EUB develop standard models, assumption and procedures that produce a more consistent process.
- Too much emphasis on the inexact art (science) of risk assessment. Far more important is standardized dispersion modelling and appropriate ERPs based on worst case scenarios.
- We would support any efforts toward standardization for modelling and risk assessment as long as it results in improved confidence by the public in the information supplied by industry to the public. The support of stakeholders is critical if we are to have any success in this arena. There is too much wasted effort occurring between industry, regulatory agencies and the public when the debate is focused on methods and procedures rather than managing the risks to acceptable societal levels.
- Efforts spent outside hearings debating the technical merits of models and coming to closure on recommended protocols is much more efficient that repetitively debating the issues inside hearings.
- In addition to the suggestions made, the committee should consider recommending an assessment of models for accuracy, by comparing predicted and measured data. Alberta has extensive real data for both modelled and monitored events that could be used in this exercise.
- We support standardized methodologies for both dispersion modelling and risk assessment. Areas to address in this standardization include the definition of "acceptable risk", "reasonably worst case" "voluntary" versus "involuntary risk". The dispersion modelling standardization should ensure that the release behaviour is better defined.
- When the variables used in risk assessment are "eliminated from the public consultation process" the public is being ignored.
- How elitist to make the statement "the Advisory Committee believes that steps should be taken to eliminate from the public consultation and hearing processes, the frequent and sometime counter productive argument surrounding the variables used in the analysis". Is this a public consultation or is this a train out of control that will run over anything in its way? There may be credence to the approaches that are used in risk assessment, but to state that they are unwilling to listen to the public is beyond belief.
- We support the multi-stakeholder approach to developing accepted specification for the assumptions used in the risk assessment process. However the proposed direction

statement does not identify how the risk assessments will be considered within the application and hearing process. The recommendations should specify the minimum requirements for risk assessments and also identify the process by which the EUB will use this information. This process identification should clearly define for potential interveners their requirements when making submissions on risk assessments.

- The more important part of the risk assessment tool is how to determine consequences and probabilities.

New Concerns

- Money would be better spent on safety features to reduce risk.
- More air monitoring is required to fully understand dispersion.
- There is a lack of discussion in the Directions Document about risk. One cannot change the hazards of sour gas; reduction of risk can only be achieved by an appropriate degree of focus on management of exposure. At times in the document hazard is implied as comprising a risk.
- I am concerned that wells may be drilled in the province without the benefit of adequate data, either from a quantity or quality point of view. I believe there are large numbers of sour wells in Alberta where we have no gas analysis data. In addition we have virtually no data with respect to the location of residences in Alberta and their proximity to sour gas facilities.
- There is a need to assess the completeness and quality of the EUB's sour gas data. We need to assess whether we are exercising due diligence in providing data to the public and industry.

2.9 Setbacks

General Comments

Of those respondents who completed response forms, the majority indicated general agreement with the directions concerning setbacks. There were also specific comments about the two sub-issues:

- criteria for setbacks
- effects of setbacks.

Respondents expressed both support and concern for the proposed multi-stakeholder setback review processes. Many respondents reiterated concerns with the existing system for setbacks, including concerns that existing setbacks are inadequate as well as concerns about increasing setbacks. Fair compensation for setbacks and restriction of future opportunities for developing the land were frequently mentioned.

Sample Comments

Criteria

- The Advisory Committee is copping out by requesting another committee deal with this issue.
- I have concerns about who might be in this multi-stakeholder group.
- Considerable research has gone into the development of the current setback distances and without new information substantiating a change, additional work is unwarranted.
- We support the proposal to re-examine setbacks following the proposed standardization of the dispersion models and risk assessment methodologies. However, the current system of setbacks has served the people of Alberta well over the years with no public death as a result of a sour gas release. Our preference is to maintain the current approach of standardized setback distances as opposed to moving to site-specific setbacks. We believe the complexity and confusion created by such setbacks would not justify possible benefits.
- The statements of direction appear to be based on purely technical assumptions. There needs to be a contextual component to them as well. Municipalities are most interested in the early extraction of resources in advance of urban development, so that there is reduced proximity of sour gas activities and facilities to other municipal uses. The ideal situation would be that proximity is not an issue and therefore does not have to be managed. A second situation is that facilities are established, well constructed, and well known (e.g., pipelines) and can therefore be well managed. The least preferred situation is uncertainty of timing, of construction, of extraction, of duration, of impact, and of liability in the event of an incident. One technique used by municipalities to respond to these contextual aspects as they impact the electorate is to define nuisance setbacks to try to increase the buffering between these uses and their residents. Our concerns lie with the timing and costs of future settlements where logical growth sequences are limited or delayed.
- We strongly encourage this Advisory Committee to follow up on the multi-stakeholder group approach. We believe that this group would be essential to fairly and realistically establishing setback criteria, Emergency Response Plans, Emergency Planning Zones, and working out the related foundational methods of dispersion modelling and risk assessment proposed in this document. However we would encourage that the Terms of Reference for this proposed multi-stakeholder group be established and agreed to before it is struck. Need to address compensation for adjacent landowners; they lose current and potential development opportunities.
- Reserves should be considered as municipalities with regards to setbacks.

Effects

- Examine the issues associated with the Disclosure Document and land sales and setbacks. If a landowner's setbacks are grandfathered a Disclosure Form must be completed at the time of the land sale. Setbacks will be recognized as illegal and this will result in expenses for the landowner.
- Future development in recreation is not possible with current setbacks.

- Setbacks have implications for the counties – when property values decline landowners want their land value reassessed and then the county receives less tax.
- Property owners should not be compensated for land impacted by setback regulations.

Other

- Setbacks don't provide protection from poor material in industry operations – leaks. water contamination etc.
- Better signage is necessary so that people know who is responsible for the facility and who to contact.
- I suggest that the "health" issue is included when discussing setbacks.

New Concerns

There were no new concerns raised, although there were some new suggestions. as indicated in the comments above.

2.10 Public Consultation by Industry

General Comments

Of those respondents who completed response forms, the majority indicated general agreement with the directions concerning public consultation by industry. Most respondents believed that public consultation could be enhanced. Some requested a clearer description of what consultation is required while others stated that adequate direction currently exists. There were suggestions for an enhanced role for EUB field office staff in consultation and facilitation. There was also support for CAPP's public involvement manual and for community/industry consultation committees.

Sample Comments

- Rather than listing seven additional recommendations for what the EUB has to develop, the same result could be achieved if the EUB developed an understanding of what levels of public consultation they felt were appropriate, identified this to industry and then rewarded (quick approvals) those who provided it and penalized (delayed approvals) those who didn't. This would require the EUB to make judgement calls about the validity of an objection or the appropriateness of a consultation program. Our experience over the last two years is that this incentive for public consultation is not being provided by the EUB. Without this incentive, commitment to real public consultation will be difficult to justify.
- You don't go far enough, we need strong legislation. You are going in the right direction but need more.
- While we support efforts towards continuous improvement with public consultation, it is not apparent that more requirements and guidelines are required. The EUB and CAPP have already put in place extensive guidelines, handbooks and communication training on this matter. There also already exist sufficient regulatory requirements, enforcement and

auditing which don't appear to be recognized in directions shaping the recommendations under this topic.

- The public must be represented in the development of a set of public consultation practices. The public must be involved in determining the direction and it should be done within a multi-stakeholder regional setting.
- At the regional level the EUB should have available staff who are trained in public consultation and facilitation.
- When a development is to take place EUB personnel should call meetings of locals to provide expertise regarding the effects. EUB officers must take an active role.
- Where concerns or issues are raised the specific information should be obtained by the interviewer and passed on the local EUB Field Centre. Field staff should investigate all allegations and a call back process should be incorporated to inform the public what the EUB has done or is doing regarding the concerns.
- Generally agree but industry must provide a balanced position: local benefits and local harm.
- I agree with your directions but also be aware that when community members and oil companies get together as in 'mediation' the oil company has everything to gain and gives only when practical. Community members have nothing to give, everything to lose.
- Consultation should be the first step in development planning. Too many times industry combines the ERP and other design aspects in the first visit, which is not consultation. Those activities should be dealt with at the appropriate time, not the first visit. This visit should be more about listening than telling.
- We need to overcome the growing "not in my backyard" sentiments that restrict industry access to the resource without any significant consequences to local stakeholder yet serious impacts for the general public welfare and standard of living in this province.
- We support the direction and emphasize the effectiveness of industry/community organizations to facilitate continual relationships.
- We are supportive of the need to raise the bar for performance by all companies and specifically support additional training to industry representatives in risk communication. This training should include not just how to communicate, but also the what to communicate including issues like flaring, emergency response, sour facilities etc.
- We agree that the CAPP *Guide for Effective Public Involvement (1998)* can form the basis for development of a set of public consultation practices endorsed by both the EUB and industry. We agree with the suggestion that information on the rights of parties be communicated as part of public consultation to help all concerned work towards resolution of issues. We also support the direction to better define local benefits.
- Industry is improving its community consultation, but improvement is still needed particularly in:
- Getting started early, when many factors are still uncertain
- Assuming that a concern voiced by a small number of individuals is that of an unreasonable individual or vocal minority, and not held by a silent majority
- Frequent personnel changes
- Public consultation should be a requirement for development of sour gas, but only to the extent that industry confirms it is complying with regulations, not as a further delaying tact to development.

- We would welcome advice about ways to improve consultation processes with First Nations.
- We strongly support the recommendation for a study defining local benefits of sour gas production.

2.11 Public Awareness and Understanding

General Comments

The majority of respondents indicated general agreement with the directions concerning public awareness and understanding. Most people supported increased public education and the creation of an information office. There were mixed opinions about whether an information office should be located within the EUB, separate from it, and/or at field locations. It was suggested that a multi-stakeholder committee provide support to an information office. There were also concerns that the directions will result in unnecessary expenses – that the information is already available.

Sample Comments

- More money should be spent on public education. A major effort should be taken to put together a comprehensive package of public information about the oil and gas industry – information that the public wants to know.
- If an Information Office is created it should be within the EUB to improve the EUB's credibility. As well the EUB needs a 24-hour phone service.
- The Information office should be independent of the EUB.
- An Information Office should reside within the EUB but it will be important to have this office supported by a multi-stakeholder committee.
- Industry/community organizations should be used as the focal point to facilitate the education.
- How much will this cost and who will pay? If the public has concerns and is uniformed there is ample information available now.
- Who will generate the information/programs identified?
- Regional offices within the EUB need to take this responsibility and should get advice from a multi-stakeholder group as to what the content should be.
- EUB officers must call meetings where development is to take place. Do not leave this to the developer.
- The public also has responsibility for making themselves informed. The EUB cannot take full responsibility for the publics' unwillingness or inability to be informed.
- Make sour gas data available on the Internet at little or no cost so that everyone has ready access. Put GIS maps of the data on the Internet – provide locations of facilities but the details would need to be purchased.

New Concerns

- There is insufficient emphasis in the document on communicating the actual level of risk from sour gas operations. What are the statistics about blowouts, knockdowns, confirmed human and animal health impacts etc?
- Greater emphasis must be made on writing reports that effectively communicate risk to the general public. Many reports are very technical and difficult to understand.

2.12 Aboriginal Issues

General Comments

There was general support for the direction for enhancing Aboriginal relations and addressing issues. A Communications Strategy Group was supported. There were questions about roles and jurisdictions i.e., the EUB's jurisdiction on reserves, the role of the Indian Oil and Gas Commission (IOGC) in relation to the EUB. It was agreed that the unique needs of the Aboriginal community pertaining to emergency response need to be addressed. Aboriginal representatives seemed pleased that the Committee consultation had opened the door to future, ongoing communication concerning sour gas activities.

Sample Comments

Interaction with the EUB

- We support the direction for more interaction and involvement of the EUB with the Aboriginal community.
- We support the direction to increase Aboriginal understanding of the sour gas industry (and vice versa) and the roles and responsibilities of the regulator.
- EUB should be involved on the Reserve from the beginning of development.
- EUB should hire appropriate First Nations staff and work with the Treaty Tribal Councils.
- A First Nations Communication Strategy Group could start and then evolve into a First Nations Advisory Group. The Communications Strategy group could communicate what has been done and formulate where to go.
- EUB, industry, and other jurisdictions must be involved with Aboriginal communities to address unique features i.e., no phones, remote, trappers on the land, dispersed population, language etc.
- Awareness and information about the EUB is needed.
- There is confusion about how the EUB and IOGC work: the regulatory process holds up work and opportunities for employment. Pipeline permits get held up at IOGC because they are unsure of provincial requirements. We need work, and we want to create opportunities for work.
- Any Aboriginal Advisory Committee should be at a regional level, not a provincial level.

Emergency Response Planning and Preparedness

- First Nations' Capacity for Emergency Response - Emergency Response Planning is an area where all government levels need to get together to ensure First Nations' safety and ability to respond to emergencies. The province must continue to act as a regulator for certain issues, such as Emergency Response Planning, where nothing is set up at the federal level or Tribal level. Tribes may eventually want to have control over these things, but for now they do not have sufficient resources for Emergency Response Planning. Representatives from IRC feel there is a need for enabling legislation to free up First Nations and the province to reach agreement on these issues. The IRC wants to find funding for an Emergency Response Office.
- EUB, industry, and other jurisdictions must be involved with Aboriginal communities to address unique features i.e., no phone, remote, trappers, dispersed population.

Other

- Traditional land use mapping should be done for all of Alberta and funded by the federal government.

New Concerns

- There are 42 – 43 First Nation communities in Alberta. What will be the communication strategy?
- Need to improve EUB relations with Aboriginal communities.
- There is confusion about how the EUB and the IOGC work
- Natives don't get compensation from Alberta Trappers Association, as do non-aboriginal trappers.

2.13 Implementation Issues

General Comments

There were few comments about this topic and most of these focused on the need for prioritization, timelines and accountabilities i.e., making sure the most important work is done first.

Sample Comments

- There needs to be more consultation surrounding the final recommendations and any timelines associated with implementing these recommendations. There should be short, medium and long term objectives associated with the many ideas collected by the Advisory Committee and these are not all conducive to quarterly reporting.
- We support the proposal to request the EUB publicly issue quarterly status reports. To help clarify accountability and responsibility for action items, we suggest that each recommendation note who is responsible and when action should be completed. Where this is not possible because detailed action plans will have to be developed by the EUB,

we suggest that the EUB provide this information, their response to the recommendations and then track progress accordingly. It may also be useful to have the Advisory Committee to the EUB monitor progress.

- EUB needs to be monitored on its performance by an independent body.
- For any recommendations rejected by the EUB, detailed reasons for rejection should be made public.
- The items should be prioritized – EUB should deal with them in order of priority.

2.14 Non-Mandate but Important Issues

Sample Comments

- In its comments regarding local interveners and intervener funding, the Committee may wish to comment on how government agencies and municipalities are considered in the application hearing process.
- Rural and urban Albertans keep daily logbooks to track pertinent data on weather conditions, flora, fauna, people and disease, run-off and sub-surface water quality, timing air pollution from flaring and toxin release.
- 24-hour video taping of flaring activity is necessary.
- Alberta Environment rules are not sufficient to protect the public and many times they break their own rules.

APPENDIX G

MAJOR SUBMISSIONS TO ADVISORY COMMITTEE ON PUBLIC SAFETY AND SOUR GAS

- An Evaluation of Emergency Planning Zone Criteria Applied in Alberta RWDI. December 2000
- A Novel Treatment Procedure for Victims of Sour Gas Exposure. Dr. Anthony Almeida. June 2000
- Risk Assessment Responses. Ian Dowsett, Michael Zelensky. June 2000
- Executive Summary. Expert Responses to Public Safety and Sour Gas Advisory Committee on Toxicity of Hydrogen Sulphide (H_2S) and Sulphur Dioxide (SO_2). October 2000
- Toxicity of Hydrogen Sulfide: Summary of Research. Dr. Sheldon Roth. May 2000